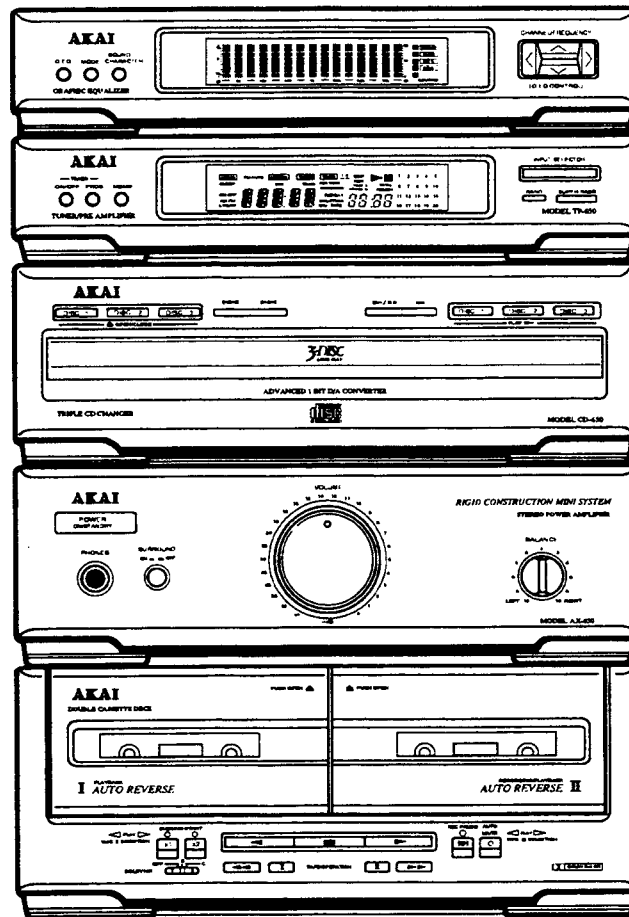


# AKAI SERVICE MANUAL



SYSTEM MX650

COMPACT  
**disc**  
DIGITAL AUDIO

MINI COMPONENT SYSTEM

## MX-550

(AX-550/CD-650/TP-550)

## MX-650

(AX-650/CD-650/TP-650)

TP-550/650

AX-550/650

CD-650

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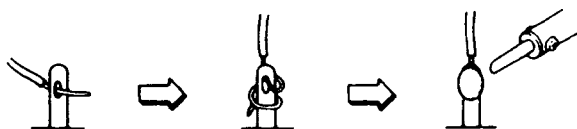
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# ★ SAFETY INSTRUCTIONS

## PRECAUTIONS DURING SERVICING

1. Parts identified by the (\*) symbol are critical for safety. Replace them only with the parts number specified.
2. In addition to safety, other parts and assemblies are specified for conformance with such regulations as those applying to spurious radiation. These must also be replaced only with the specified replacements.  
Examples: RF converters, tuner units, antenna selector switches, RF cables, noise blocking capacitors, noise blocking filters, etc.
3. Use specified internal wiring. Note especially:
  - 1) Wires covered with PVC tubing
  - 2) Double insulated wires
  - 3) High voltage leads
4. Use specified insulating materials for hazardous live parts. Note especially:
  - 1) Insulation Tape
  - 2) PVC tubing
  - 3) Spacers (insulating barriers)
  - 4) Insulation sheets for transistors
  - 5) Plastic screws for fixing micro switches
5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.), wrap the ends of the wires securely around the terminals before soldering.



6. Make sure that wires do not contact heat producing parts (heat sinks, oxide metal film resistors, fusible resistors, etc.).
7. Check that replaced wires do not contact sharp edged or pointed parts.
8. Also check areas surrounding repaired locations.
9. Make sure that foreign objects (screws, solder drop-lets, etc.) do not remain inside the set.

## MAKE YOUR CONTRIBUTION TO PROTECT THE ENVIRONMENT

Used batteries with the ISO symbol for recycling as well as small accumulators (rechargeable batteries), mini-batteries (cells) and starter batteries should not be thrown into the garbage can. Please leave them at an appropriate depot. All other household batteries can be thrown out with the household waste.



## SAFETY CHECK AFTER SERVICING

After servicing, make measurements of leakage-current or resistance in order to determine that exposed parts are acceptably insulated from the supply circuit.

The leakage-current measurement should be done between accessible metal parts (such as chassis, ground terminal, microphone jacks, signal input/output connectors, etc.) and the earth ground through a resistor of 1500

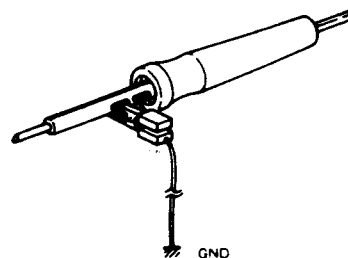
ohms paralleled with a 0.15  $\mu$ F capacitor, under the unit's normal working conditions.

The leakage-current should be less than 0.5 mA rms AC. The resistance measurement should be done between accessible exposed metal parts and power cord plug prongs with the power switch (if included) "ON". The resistance should be more than 2.2 M Ohms.

## PRECAUTIONS IN REPAIRING

When repairing or adjusting the unit, please note the following points.

1. Do not put excessive pressure on the mechanical part (operation part), including the pick-up block, as extremely high mechanical precision is required in these parts.
2. When the base is removed for repair or adjustment, make sure that there are no metal objects in the narrow gap between the P.C. board or the mecha parts and the base.
3. The Micro-Computer and the CD signal processing ICs can be damaged by static electricity or leakage from a soldering iron during repairing. While soldering, please take the precautions against leakage as in the illustration.



4. Do not loosen any screws in the pick-up block. When handling the pick-up block, please refer to the points to NOTE when replacing the pick up block.
5. To avoid hazardous invisible Laser Radiation, DO NOT look at the Laser Beam (Objective lens) directly.
6. On models for some countries, laser warning labels are affixed on the unit and inside of the unit, as shown below. For your safety, read these labels carefully when repairing or adjusting the unit.

[EUROPE, SCANDINAVIA, UK and AUSTRALIA]

CLASS 1 LASER PRODUCT  
KLASSE 1 LASER PRODUKT  
LUOKAN 1 LASER LAITE  
KLASS 1 LASER APPARAT

Label affixed on the rear panel of the unit

CAUTION : INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED. AVOID EXPOSURE TO BEAM.  
ADVARSEL : USYNLIG LASERSTRÅLING VED ÅBNING. HÅR SIKKERHEDSÅBRYDERE ER UDDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.  
VARO : AVATTAESSA JA SUOJALUKITUS OHJET. TAESSA OLET ALLTIMA NAKYMATTOALLE LASERSATEI LYLLE ALA KATSO SATEESEEN.  
VARNING : OSYNLIG LASERSTRÅLING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRÄKTA EJ STRÅLEN.

Label affixed on the reverse side of the rear panel of the unit

# ★ INFORMATIONS

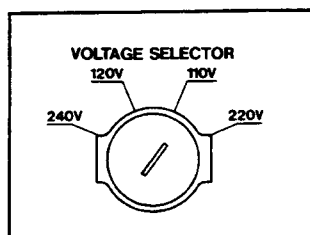
## SYMBOLS FOR PRIMARY DESTINATION

Alphabet indicates the destination of the units as listed below.

Symbol	Principal Destination
<b>B</b>	UK
<b>E</b>	Europe (except UK)
<b>S</b>	Australia
<b>V</b>	Germany
<b>U</b>	Universal
<b>Y*</b>	Custom version

## VOLTAGE CONVERSION ( **U** Model only)

Before connecting the power cord, set the VOLTAGE SELECTOR located on the rear panel of the AX-550/650 so that the correct voltage for your area is indicated.



## PRECAUTION BEFORE REPAIRING THE UNIT

### [ABOUT THE POWER SUPPLY]

When repairing, refer to the following procedures to supply the power to each unit.

#### • TP-550/650

Connect the two black and red CONTROL CONNECTORS to the AX-550/650. Then while pressing the TIMER ON/OFF and TIMER MEMORY buttons on the front panel simultaneously, connect the AC POWER CORD on the AX-550/650 to the AC power outlet.

#### • CD-650

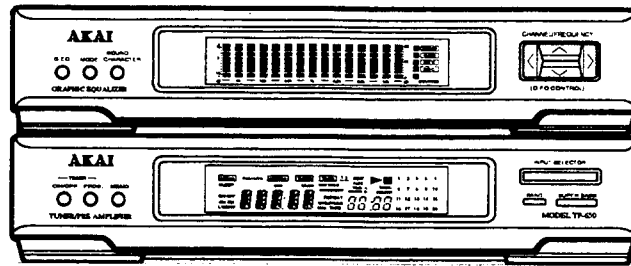
Power for the CD-650 is supplied from the AX-550/650 through the TP-550/650.

Therefore, when repair of the CD-650 is necessary, repair should be made together with the AX-550/650 and TP-550/650.

#### • AX-550/650

While pressing the ► and ◄ buttons simultaneously on the AX-550/650, connect the AC power cord to the AC power outlet.





MODEL TP-650

## TUNER/PRE AMPLIFIER

# MODEL TP-550/650

## SPECIFICATIONS

### Tuner section

#### FM

Tuning frequency range ..	87.5 to 108MHz
Usable sensitivity .....	13.2dBf [E/U], 17.2dBf [V] (IHF, 3% THD)
Quieting sensitivity	
Mono .....	17.2dBf [E/U], 21.2dBf [V]
Stereo .....	31.2dBf [E/U], 35.2dBf [V]
S/N ratio	
Mono .....	70dB [E/U], 65dB [V] (IHF)
Stereo .....	60dB (IHF)
Frequency response .....	30Hz to 15kHz ( $\pm 1$ dB)
Total harmonic distortion	
Mono .....	0.5% (at 1kHz)
Stereo .....	0.3% [E/U], 0.7% [V] (at 1kHz)
Selectivity .....	55dB ( $\pm 400$ kHz)
Image rejection .....	50dB
Stereo separation .....	45dB (at 1kHz)
Capture ratio .....	2dBf
AM suppression .....	60dB
Spurious rejection .....	55dB
IF rejection .....	90dB

#### MW

Tuning frequency range ..	531 to 1602kHz (9kHz step)
530 to 1710kHz [U]	
(10kHz step)	
Usable sensitivity .....	500 $\mu$ Vm
S/N ratio .....	36dB
Selectivity .....	15dB
Image rejection .....	37dB
IF rejection .....	40dB

#### LW

Tuning frequency range ..	144 to 351kHz [E/U], 144 to 288kHz [V] (1kHz step)
Usable sensitivity .....	800 $\mu$ Vm
S/N ratio .....	28dB
Selectivity .....	17dB
Image rejection .....	33dB
IF rejection .....	40dB

### Amplifier Section

Super bass effects .....	6dB / 60Hz (SB-1) 12dB / 60Hz (SB-2)
Tone control (TP-550 only)	
BASS .....	$\pm 8$ dB / 100Hz
TREBLE .....	$\pm 8$ dB / 10kHz
Graphic Equalizer (TP-650 only)	
Center frequency .....	63Hz / 160Hz / 400Hz / 1kHz / 2.5kHz / 6.3kHz / 16kHz
Control range .....	$\pm 10$ dB (2dB step)
S/N ratio .....	97dB (A-weight)
Total harmonic distortion	0.027% (1kHz, flat)
Timer .....	Quartz lock daily timer (Timer REC / Wake-up / Sleep)

### Dimensions

TP-550 .....	270 (W) x 112 (H) x 310 (D)mm
TP-650 .....	270 (W) x 112 (H) x 302 (D)mm

### Weight

TP-550 .....	2.0kg
TP-650 .....	2.1kg

### Standard accessories

FM long wire antenna.....	x1
AM loop antenna .....	x1
Plug adaptor .....	x1

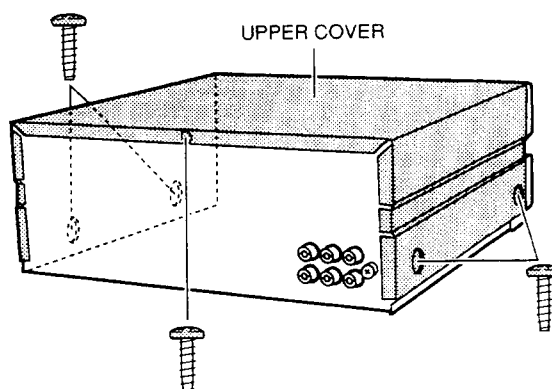
TP-550/650

\* For improvement purposes, specifications and design are subject to change without notice.

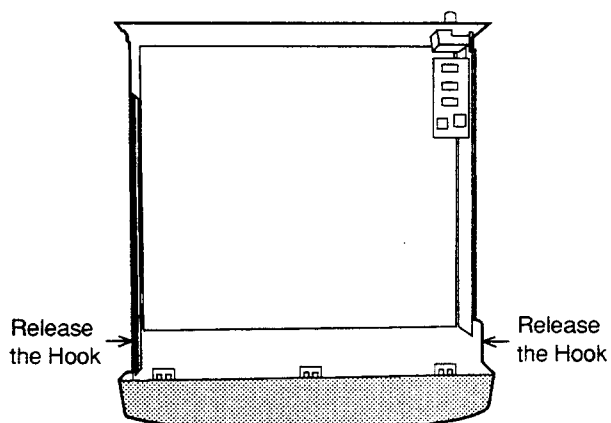
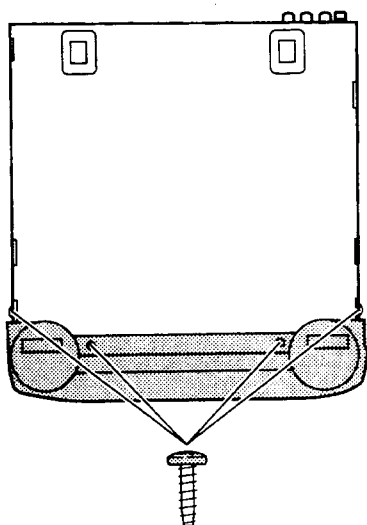
# 1. DISASSEMBLY

In case of trouble etc., necessitating dismantling, please dismantle in the order shown in the illustrations. Reassemble in the reverse order.

## 1. Removal of UPPER COVER



## 2. Removal of FRONT PANEL



## II. PRINCIPAL PARTS LOCATION

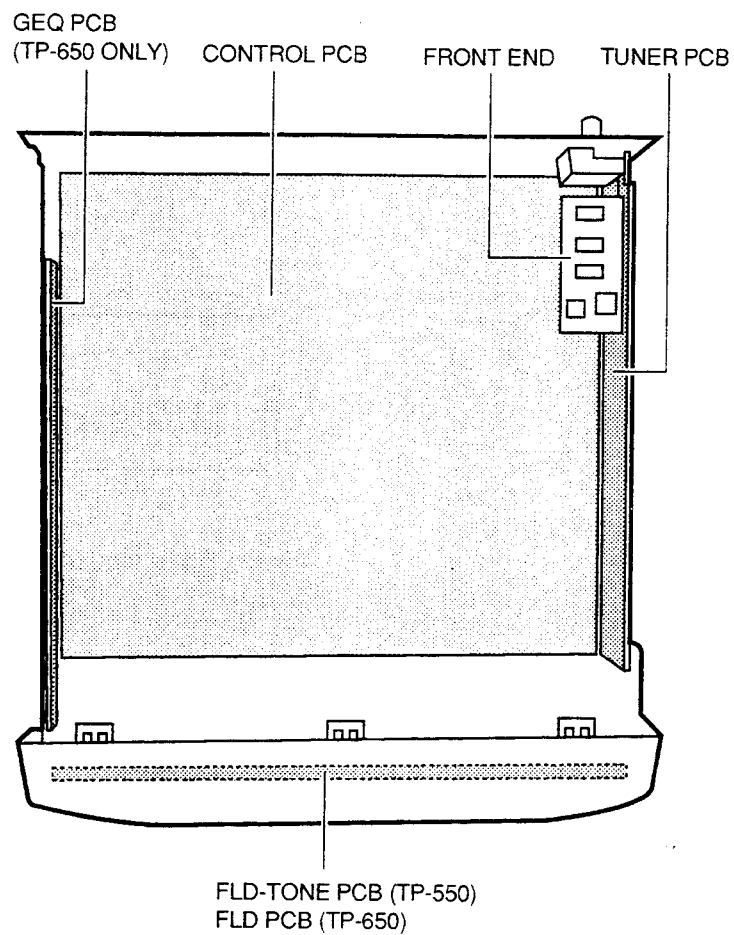


Fig.2-1 Top view

# III.ADJUSTMENT

## 3-1.INSTRUMENT CONNECTIONS

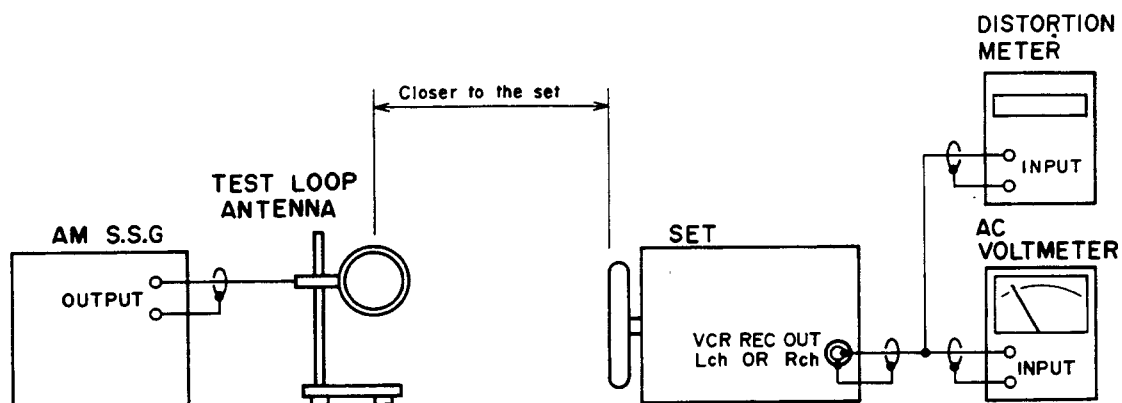


Fig.3-1 Instrument Connection of AM Adjustment

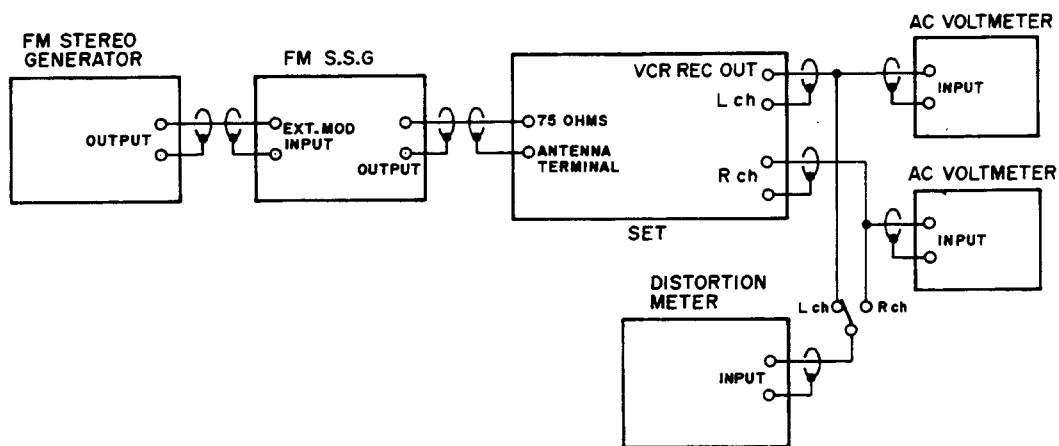


Fig.3-2 Instrument Connection of FM Adjustment

### NOTE:

Before making adjustment, please set the input to "TUNER" mode by pressing the input SELECTOR button on the TP-550/650, then select the tuner band with the BAND button according to the adjustment procedure.

## 3-2. ADJUSTMENT

**NOTE:** 1. Set the S.S.G. to 1kHz, 75kHz deviation for **U**, **S**, **B** or **E** model, 1 kHz, 40 kHz deviation for **V** model.

STEP	ADJUSTMENT ITEM
1.	SSG FREQ. & OUTPUT LEVEL
2.	SET Tuning FREQ.
3.	ADJ. Part
4.	REMARKS (•) & RESULT (*)

Test Point      Adjustment Part

### LW

#### 2 LW SENSITIVITY

- 162kHz, 75dBμ (Low) or 297kHz <288kHz>, 75dBμ (High)
- 162kHz PRESET 4 ch, 297kHz <288kHz> PRESET 7 ch.
- T202 (Low), VC202 (High)
- Connect the milli-voltmeter to VCR/REC OUT.  
\*Maximum output level.  
\*For best result, repeat Low and High adjustments several times.

**NOTE:** 1. Set the S.S.G to 1kHz 30% modulation on each adjustment.  
2. Frequencies indicated in < > are for the **V** model.

#### 1 LW OSC

- 
- 351kHz <288kHz> (preset 10 ch)
- T204
- Connect the Digital DC Voltmeter between TP1 and GND.  
\*8.2 + 0.1V <5.75 + 0.1V>.

### FM

#### 3 DISTORTION (STEREO)

- 98.0MHz, 60dBμ (STEREO L or R channel only)
- 98.0MHz
- IFT (FRONT END)
- Connect the distortion meter to VCR/REC OUT.  
\*Minimum Distortion

#### 2 TUNING LED

- 98.0MHz, 22dBμ (MONO).
- 98.0MHz
- Tuning LED on the front panel, VR101.
- \*Tuning LED is lit.

#### 1 CENTER VOLTAGE

- 98.0MHz, 60dBμ (MONO)
- 98.0MHz
- T101
- Connect the DC Digital Voltmeter to both ends of R108.  
\*0 + 50mV

#### 4 STEREO SEPARATION

- 98.0MHz, 60dBμ (STEREO L or R channel only)
- 98.0MHz
- VR102
- Connect the milli-voltmeter to VCR/REC OUT.  
\*Minimum output level for opposite channel.

### AM

**NOTE:** Set the S.S.G to 1kHz 30% modulation on each adjustment.

#### 2 AM (MW) SENSITIVITY

- 603kHz, 70dBμ (Low) or 1,404kHz, 70dBμ (High)
- 603kHz (Low), PRESET 8 ch  
1,404kHz (High), PRESET 7 ch
- T201 (Low), VC201 (High)
- Connect the milli-voltmeter to VCR/REC OUT.  
\*Maximum output level.  
\*For best result, repeat Low a High adjustments several times.

#### 1 AM (MW) OSC

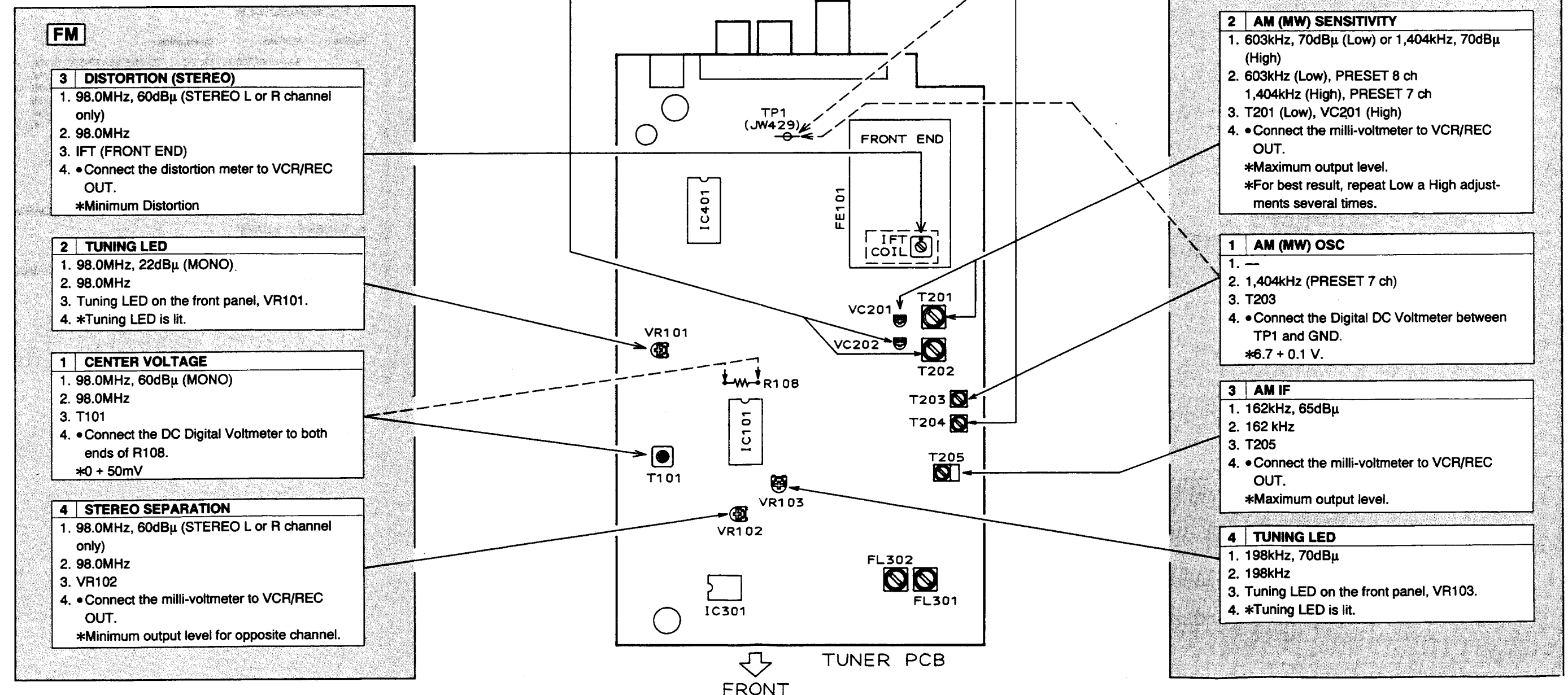
- 
- 1,404kHz (PRESET 7 ch)
- T203
- Connect the Digital DC Voltmeter between TP1 and GND.  
\*6.7 + 0.1 V.

#### 3 AM IF

- 162kHz, 65dBμ
- 162 kHz
- T205
- Connect the milli-voltmeter to VCR/REC OUT.  
\*Maximum output level.

#### 4 TUNING LED

- 198kHz, 70dBμ
- 198kHz
- Tuning LED on the front panel, VR103.
- \*Tuning LED is lit.



IV. PARTS LIST

ATTENTION

1. When placing an order for parts, be sure to list Part No., Model No. and the description of eachpart. Otherwise, the non-delivery of the part or the delivery of a wrong part may result.
2. Please make sure that Part No. is correct when ordering. If not, a part different from the one you ordered may be delivered.
3. Since the parts shown in Parts List of Preliminary Service Manual may have been the subject of changes, please use this Parts List for all future reference.

HOW TO USE THIS PARTS LIST

1. This Parts List lists those parts which are considered necessary for repairs. Other common parts, such as resistors and capacitors, are listed in the "Common List for Service Parts" from which these parts should be selected and stocked.
2. The Recommended Spare Parts List shows those parts in the Parts List which are considered particularly important for service.
3. Parts not shown in the Parts List and "Common List for Service Parts" will not in principle be supplied.
4. How to read the Parts List.

a) Mechanism Block

2. HEAD BASE BLOCK

Ref. No.	Part No.	Description
1	BH-T2023A320A	HEAD BASE BLOCK
2	HP-H2206A010A	HEAD R/P PR4-8FU C
3	ZS-477876	PAN20×03STL CMT
4	ZS-536488	BID20×08STL CMT
5	ZG-402895	SP CS ANGLE ADJUST

SP (Service Parts) Classification

This number corresponds with the individual parts index number in that figure.

b) PC Board

6. MAIN PC BOARD

Ref. No.	Part No.	Description
IC1	EI-324536	IC HD14049BP
IC2	EI-336801	IC MB8841-564M
C1A	EC-338399	C MMY V 223M 250AC [U,E,B,S]
C1B	EC-350949	C MMY V 223M 250DC [J]
C1C	EC-338397	C MMY V 223M 125AC [C,A]
X1	EI-318384	OSC X'TAL NC-18C

Symbols for primary destination

[A] : AAL (U.S.A) [S] : SAA (Australia)

[B] : BEAB (England) [U] : U/T (Universal Area)

[C] : CSA (Canada)

[E] : CEE (Europe) [V] : VDE (Germany)

[J] : JPN (Japan) [Y] : Custom Version

SP (Service Parts) Classification

These reference symbols correspond with component symbols in the Schematic Diagrams.

The available PC Board Blocks are listed separately.

5. When Part No. is known, Parts Index at end of Parts List can be used to locate where that part is shown in Parts List by its Reference No. listed at right of Part No.

WARNING

⚠ (\*) INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURE'S RECOMMENDED PARTS.

AVERTISSEMENT

⚠ (\*) IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT.

1. RECOMMENDED SPARE PARTS

We suggest you to stock the following Recommended Spare Part items listed below since they can cover most of the routine service.

Ref.No.	Part No.	Description
1	*EC-408691J	C DBL LAYER EECF5R5U105
2	ED-408651J	D LED SEL2913K ORANGE
3	ED-307572	D SILICON H 1SS131
4	ED-624903	D SILICON H 1S2473
5	*ED-511907	D SILICON 1N4002 100/1.0A
6	ED-372893	D VARACTOR SVC321SPA A DBL
7	ED-397289J	D ZENER H HZS20-2
8	ED-367576	D ZENER H HZS5.6B2J
9	ED-389688J	D ZENER H HZS5B2
10	ED-370786	D ZENER H HZS9.1B2J
11	ED-346559	D ZENER H HZ12B2L
12	ED-346560	D ZENER H HZ12B3L
13	ED-337990	D ZENER H HZ27-1L
14	ED-329058	D ZENER H HZ5 C1
15	ED-346531	D ZENER H HZ7A2L
16	ED-351418	D ZENER H HZ7B1L
17	ED-346534	D ZENER H HZ7C1L
18	EE-408686J	FRONT END FE415-G10
19	EH-364919	COMP R RKC8BS 473J
20	EH-408650J	COMP R RYLS7J105 105J
21	EH-394759J	FILTER CE SFE10.7MS2GK-A [U,E]
22	EH-338338	FILTER CE SFE10.7MS3GK-A [V]
23	EH-360924	FILTER LC BP BPMB6A [V]
24	EH-405199J	FILTER LC LP K7-J1YD-0170 [V]
25	EH-408815J	FILTER LC LP 42B-5226-03
26	EI-382660J	IC BA15218-DX
27	EI-387938J	IC HD74LS05P
28	EI-408673J	IC LA1851N
29	EI-408648J	IC LA3607
30	EI-408647J	IC LC7522
31	EI-408645J	IC LC866008A-*** MXA1GE1
32	EI-354951	IC LM7000N
33	EI-408675J2	IC M38173M6-145FP MXA1TP3
34	EI-213390	IC NJM4558D
35	EI-400756J	IC NJM4558L-B
36	EI-408672J	IC S-80721AN
37	EI-302233	IC TC4051BP
38	EI-332259	IC TC4052BP
39	EI-200573	IC TC4053BP
40	EI-408646J	IC XR1091ECP
41	EI-408674J	OSC CE CSB456F15 19.000KHZ
42	EI-408649J	OSC CE CST12.0MTW 12.000MHZ
43	EI-405327J	OSC CE CST6.00MGW 6.000MHZ
44	EI-368825M	OSC XTAL C-002RX 32.768KHZ
45	EI-408814M	OSC XTAL HC-49/U 7200KHZ
46	EM-408410J	IND FL BJ035GK DOUBLE
47	EM-408409J	IND FL 10-MT-44GK CHARACTER
48	EO-408689M	COIL DET 1 499HNAS0078Z10.7MHZ
49	EO-408687J	COIL IFT BCFAZ-024
50	EO-363279	COIL OSC 2 A7NRS-9857X 150.0UH
51	EO-352089	COIL OSC 2 7BRS-9098X 580.0UH
52	EO-408808M	COIL VARI 2 MRHNF-45614A
53	EO-408809M	COIL VARI 2 MRZNF-45615A
54	*ER-326169	R FUSE H S10 ERD2FC 1/4W 22R0G
55	*ER-331619	R FUSE H S10 ERD2FC 1/4W 39R0G
56	*ER-318647	R FUSE H S10 ERD2FC 1/4W 4R7J
57	*ER-318248	R FUSE H S10 ERD2FC 1/4W 47R0G
58	*ER-386215J	R OMF H S12 FS 1W 220J
59	*ER-408692J	R OMF H S15 FS 2W 390J
60	ES-408641J	SW TACT EVQ 233 07K T05
61	ES-362883	SW TACT SKHLM
62	ET-403246J	DETECTOR HC-377
63	ET-356336	TR DTA114ES
64	ET-369248	TR DTA114YS
65	ET-354370	TR DTA124ES
66	ET-353897	TR DTC114ES
67	ET-354371	TR DTC124ES
68	ET-373392	TR DTC124XS
69	ET-354364	TR DTC143TS
70	ET-354414	TR DTC144ES

Ref.No.	Part No.	Description
71	ET-354094	TR DTC144WS
72	ET-349458	TR FET 2SK192A Y
73	ET-337759	TR FET 2SK246 GR
74	ET-353899	TR 2SA1317 S,T,U
75	*ET-366365	TR 2SB1185 E,F
76	ET-400965J	TR 2SB1357 E,F T05
77	ET-397160J	TR 2SC3330 R,S,T,U,V
78	ET-361736	TR 2SC3576
79	ET-394735J	TR 2SC3792 T05
80	ET-328265	TR 2SC930 F
81	*ET-366581	TR 2SD1762 E,F
82	*ET-373025	TR 2SD1944 J1,J2,K
83	ET-401091J	TR 2SD2144S U,V,W T05
84	ET-396072J	TR 2SD2159 V,W
85	EV-408643J	VR ROTARY RK14K1240L=15 B103X2
86	EV-408642J	VR ROTARY RK14K1240L=20 B103X2
87	EW-408817J	CORD A6007 L=160 13P
88	EW-408816J	CORD A6007 L=160 9P
89	EW-408819J	CORD A6009 L=130 13P
90	EW-408818J	CORD A6009 L=130 9P
91	EW-408681J	WIRE ASSY HFG0711-5201L530 11P
92	EW-408676J	WIRE ASSY HFG07157601 L580 15P
93	EW-408679J	WIRE ASSY 52305-1411 L=650 14P

2. P.C BOARD BLK

Ref.No.	Part No.	Description
1A	BA-A6007T030A	ML PC (#) TU-PRE BLKTP-550 (U) /ML
1B	BA-A6007T030B	ML PC (#) TU-PRE BLKTP-550 (E) /ML
1C	BA-A6007T030C	ML PC (#) TU-PRE BLKTP-550 (V) /ML
1D	BA-A6007T030D	ML PC (#) TU-PRE BLKTP-650 (U) /ML
1E	BA-A6007T030E	ML PC (#) TU-PRE BLKTP-650 (E) /ML
1F	BA-A6007T030F	ML PC (#) TU-PRE BLKTP-650 (V) /ML
2	BA-A6007T040A	ML PC FL-TON BLK TP-550/ML [TP-550]
3	BA-A6008T050A	ML PC (#) FL-GEQ BLK TP-650/ML [TP-650]

PC (#) TU-PRE BLK CONSISTS OF FOLLOWING P.C BOARD.

- TUNER P.C BOARD
- CONTROL P.C BOARD

PC (#) FL-GEQ BLK CONSISTS OF FOLLOWING P.C BOARD.

- FLD P.C BOARD
- GEQ P.C BOARD

### 3. TUNER P.C BOARD

Ref.No.	Part No.	Description
D101	ED-307572	D SILICON H 1SS131
D201	ED-372893	D VARACTOR SVC321SPA A DBL
D202	ED-372893	D VARACTOR SVC321SPA A DBL
D203	ED-307572	D SILICON H 1SS131
D204	ED-307572	D SILICON H 1SS131
D401	ED-367576	D ZENER H HZS5.6B2J
D402	ED-307572	D SILICON H 1SS131
D403	ED-307572	D SILICON H 1SS131
D404	ED-307572	D SILICON H 1SS131
D405	ED-370786	D ZENER H HZS9.1B2J
D406	ED-389688J	D ZENER H HZS5B2
FE101	EE-408686J	FRONT END FE415-G10
FL101	EH-360924	FILTER LC BP BPMB6A
FL102A	EH-394759J	FILTER CE SFE10.7MS2GK-A
FL102B	EH-338338	FILTER CE SFE10.7MS3GK-A
FL103A	EH-394759J	FILTER CE SFE10.7MS2GK-A
FL103B	EH-338338	FILTER CE SFE10.7MS3GK-A
FL104	EH-405199J	FILTER LC LP K7-J1YD-0170
FL301	EH-408815J	FILTER LC LP 42B-5226-03
FL302	EH-408815J	FILTER LC LP 42B-5226-03
IC101	EI-408673J	IC LA1851N
IC301	EI-213390	IC NJM4558D
IC401	EI-354951	IC LM7000N
L101	EO-357539	COIL FIX 1 EL0606RA T05 222K
L301	EO-353588	COIL FIX 1 LAP02 F05 2R2K
L302	EO-353588	COIL FIX 1 LAP02 F05 2R2K
R107	ER-324184	R CB H S10 FS RDS 1/4W 121J
R108	ER-333387	R CB H S10 FS RDS 1/4W 223J
R425	*ER-318647	R FUSE H S10 ERD2FC 1/4W 4R7J
T101	EO-408689M	COIL DET 1 499HNAS0078Z10.7MHZ
T201	EO-408808M	COIL VARI 2 MRHNF-45614A
T202	EO-408809M	COIL VARI 2 MRZNF-45615A
T203	EO-363279	COIL OSC 2 A7NRS-9857X 150.0UH
T204	EO-352089	COIL OSC 2 7BRS-9098X 580.0UH
T205	EO-408687J	COIL IFT BCFAZ-024
TM1	EJ-359031	TERMINAL LEVER YKD31-0215 P 2P
TR101	ET-328265	TR 2SC930 F
TR102	ET-397160J	TR 2SC3330 R,S,T,U,V
TR201	ET-349458	TR FET 2SK192A Y
TR202	ET-394735J	TR 2SC3792 T05
TR203	ET-353897	TR DTC114ES
TR401	ET-337759	TR FET 2SK246 GR
TR402	ET-397160J	TR 2SC3330 R,S,T,U,V
TR403	ET-354094	TR DTC144WS
TR404	ET-354094	TR DTC144WS
TR405	ET-354094	TR DTC144WS
TR406	ET-353899	TR 2SA1317 S,T,U
TR407	ET-353899	TR 2SA1317 S,T,U
TR408	ET-396072J	TR 2SD2159 V,W
VC201	EC-337603	C S-FIX H VCT51F 5.5-30
VC202	EC-356284	C S-FIX H VCT51G 7.5- 50
VR101	EV-358829	R S-FIX H RH0615C 0.10W 223
VR102	EV-356576	R S-FIX H RH0615C 0.10W 472
VR103	EV-356576	R S-FIX H RH0615C 0.10W 472
X101	EI-408674J	OSC CE CSB456F15 19.000KHZ
X401	EI-408814M	OSC XTAL HC-49/U 7200KHZ

### 4. CONTROL P.C BOARD

Ref.No.	Part No.	Description
C764	*EC-346868	C CE V T05 F 473Z 50DC
C765	*EC-346868	C CE V T05 F 473Z 50DC
C766	*EC-346868	C CE V T05 F 473Z 50DC
C767	*EC-346868	C CE V T05 F 473Z 50DC
C801	*EC-408691J	C DBL LAYER EECF5R5U105
D701	ED-346534	D ZENER H HZ7C1L
D702	ED-346534	D ZENER H HZ7C1L
D751	*ED-511907	D SILICON 1N4002 100/1.0A
D752	*ED-511907	D SILICON 1N4002 100/1.0A
D753	*ED-511907	D SILICON 1N4002 100/1.0A
D754	*ED-511907	D SILICON 1N4002 100/1.0A
D755	ED-346559	D ZENER H HZ12B2L
D756	ED-346560	D ZENER H HZ12B3L
D757	*ED-511907	D SILICON 1N4002 100/1.0A
D758	*ED-511907	D SILICON 1N4002 100/1.0A
D759	*ED-511907	D SILICON 1N4002 100/1.0A
D760	ED-337990	D ZENER H HZ27-1L
D761	*ED-511907	D SILICON 1N4002 100/1.0A
D762	*ED-511907	D SILICON 1N4002 100/1.0A
D763	ED-351418	D ZENER H HZ7B1L
D764	ED-346531	D ZENER H HZ7A2L
D765	*ED-511907	D SILICON 1N4002 100/1.0A
D766	ED-511907	D SILICON 1N4002 100/1.0A
D767	ED-511907	D SILICON 1N4002 100/1.0A
D768	ED-329058	D ZENER H HZ5 C1
D801	ED-307572	D SILICON H 1SS131
D802	ED-307572	D SILICON H 1SS131
D803	ED-307572	D SILICON H 1SS131
D804	ED-307572	D SILICON H 1SS131
D805	ED-307572	D SILICON H 1SS131
D807	ED-307572	D SILICON H 1SS131
D808	ED-307572	D SILICON H 1SS131
D809	ED-307572	D SILICON H 1SS131
D811	ED-511907	D SILICON 1N4002 100/1.0A
D812	ED-511907	D SILICON 1N4002 100/1.0A
D813	ED-307572	D SILICON H 1SS131
D814	ED-511907	D SILICON 1N4002 100/1.0A
D815	ED-307572	D SILICON H 1SS131
D821	ED-397289J	D ZENER H HZS20-2
D822	ED-307572	D SILICON H 1SS131
IB801	EH-364919	COMP R RKC8BS 473J
IC501	EI-302233	IC TC4051BP
IC502	EI-200573	IC TC4053BP
IC601	EI-302233	IC TC4051BP
IC602	EI-200573	IC TC4053BP
IC701	EI-382660J	IC BA15218-DX
IC702	EI-400756J	IC NJM4558L-B
IC703	EI-400756J	IC NJM4558L-B
IC704	EI-332259	IC TC4052BP
IC801	EI-408675J2	IC M38173M6-145FP MXA1TP3
IC802	EI-387938J	IC HD74LS05P
IC804	EI-408672J	IC S-80721AN
J11A	EJ-408669J	PIN J T6060AABF W/SHIELD 6P
J11B	EJ-408668J	PIN J T5916-AABH 6P
R751	*ER-386215J	R OMF H S12 FS 1W 220J
R752	*ER-386215J	R OMF H S12 FS 1W 220J
R759	*ER-386215J	R OMF H S12 FS 1W 220J
R764	*ER-326169	R FUSE H S10 ERD2FC 1/4W 22R0G
R765	*ER-408692J	R OMF H S15 FS 2W 390J
TR501	ET-394735J	TR 2SC3792 T05
TR502	ET-394735J	TR 2SC3792 T05
TR512	ET-397160J	TR 2SC3330 R,S,T,U,V
TR601	ET-394735J	TR 2SC3792 T05
TR602	ET-394735J	TR 2SC3792 T05
TR612	ET-397160J	TR 2SC3330 R,S,T,U,V
TR751	ET-397160J	TR 2SC3330 R,S,T,U,V
TR752	*ET-373025	TR 2SD1944 J1,J2,K
TR753	ET-353899	TR 2SA1317 S,T,U
TR754	*ET-366365	TR 2SB1185 E,F
TR755	ET-353899	TR 2SA1317 S,T,U
TR756	*ET-366365	TR 2SB1185 E,F
TR757	ET-397160J	TR 2SC3330 R,S,T,U,V
TR758	*ET-366581	TR 2SD1762 E,F
TR759	ET-397160J	TR 2SC3330 R,S,T,U,V

Ref.No.	Part No.	Description
TR760	ET-353899	TR 2SA1317 S,T,U
TR761	ET-353899	TR 2SA1317 S,T,U
TR801	ET-354371	TR DTC124ES
TR802	ET-354371	TR DTC124ES
TR803	ET-354371	TR DTC124ES
TR804	ET-354371	TR DTC124ES
TR805	ET-354371	TR DTC124ES
TR806	ET-353897	TR DTC114ES
TR807	ET-354371	TR DTC124ES
TR808	ET-354370	TR DTA124ES
TR809	ET-373392	TR DTC124XS
TR810	ET-369248	TR DTA114YS
TR811	ET-353897	TR DTC114ES
TR812	ET-354370	TR DTA124ES
TR815	ET-353899	TR 2SA1317 S,T,U
TR816	ET-354371	TR DTC124ES
TR817	ET-356336	TR DTA114ES
TR818	ET-401091J	TR 2SD2144S U,V,W T05
TR819	ET-401091J	TR 2SD2144S U,V,W T05
TS801	ES-362883	SW TACT SKHLM
W1	EW-408676J	WIRE ASSY HFG07157601 L580 15P
W2	EW-408679J	WIRE ASSY 52305-1411 L=650 14P
W3	EW-408681J	WIRE ASSY HFG0711-5201L530 11P
X801	EI-405327J	OSC CE CST6.00MGW 6.000MHZ
X802	EI-368825M	OSC X'TAL C-002RX 32.768KHZ

## 5. FLD/TONE P.C BOARD (TP-550)

Ref.No.	Part No.	Description
D1	ED-307572	D SILICON H 1SS131
D2	ED-307572	D SILICON H 1SS131
D3	ED-307572	D SILICON H 1SS131
D4	ED-307572	D SILICON H 1SS131
D5	ED-307572	D SILICON H 1SS131
D6	ED-307572	D SILICON H 1SS131
D7	ED-408651J	D LED SEL2913K ORANGE
D8	ED-408651J	D LED SEL2913K ORANGE
D9	ED-408651J	D LED SEL2913K ORANGE
D10	ED-307572	D SILICON H 1SS131
IC1	EI-400756J	IC NJM4558L-B
IC2	EI-400756J	IC NJM4558L-B
IN1	EM-408409J	IND FL 10-MT-44GK CHARACTER
PH1	ET-403246J	DETECTOR HC-377
TR1	ET-353899	TR 2SA1317 S,T,U
TS1	ES-408641J	SW TACT EVQ 233 07K T05
TS2	ES-408641J	SW TACT EVQ 233 07K T05
TS3	ES-408641J	SW TACT EVQ 233 07K T05
TS4	ES-408641J	SW TACT EVQ 233 07K T05
TS5	ES-408641J	SW TACT EVQ 233 07K T05
TS6	ES-408641J	SW TACT EVQ 233 07K T05
TS7	ES-408641J	SW TACT EVQ 233 07K T05
TS8	ES-408641J	SW TACT EVQ 233 07K T05
TS9	ES-408641J	SW TACT EVQ 233 07K T05
TS10	ES-408641J	SW TACT EVQ 233 07K T05
VR1	EV-408642J	VR ROTARY RK14K1240L=20 B103X2
VR2	EV-408643J	VR ROTARY RK14K1240L=15 B103X2
W2	EW-408817J	CORD A6007 L=160 13P
W3	EW-408817J	CORD A6007 L=160 13P
W4	EW-408816J	CORD A6007 L=160 9P

## 6. FLD P.C BOARD (TP-650)

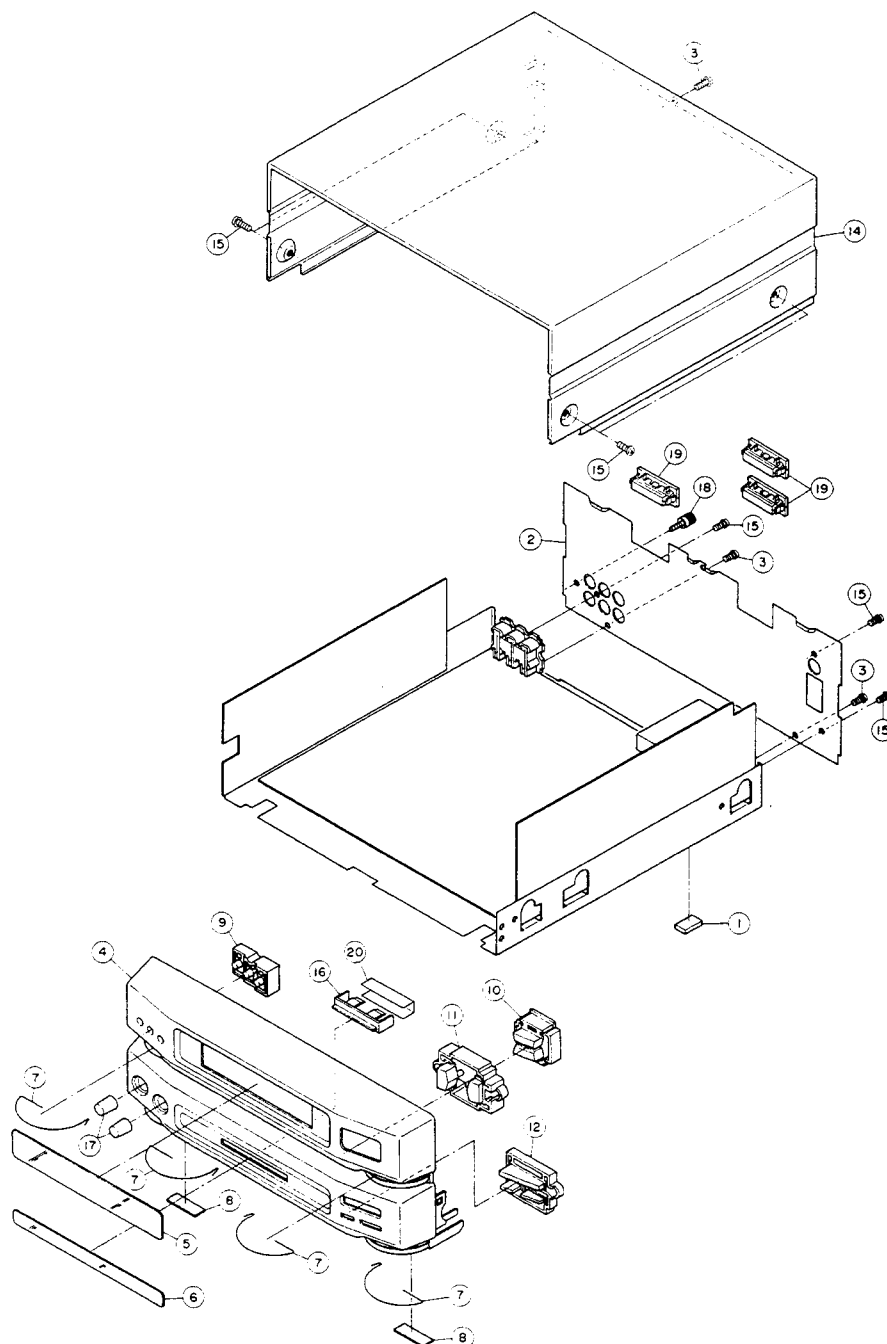
Ref.No.	Part No.	Description
D101	ED-624903	D SILICON H 1S2473
D102	ED-624903	D SILICON H 1S2473
D103	ED-624903	D SILICON H 1S2473
D104	ED-624903	D SILICON H 1S2473
D105	ED-307572	D SILICON H 1SS131
D106	ED-307572	D SILICON H 1SS131
D107	ED-307572	D SILICON H 1SS131
D108	ED-307572	D SILICON H 1SS131
D109	ED-408651J	D LED SEL2913K ORANGE
D110	ED-307572	D SILICON H 1SS131
D111	ED-307572	D SILICON H 1SS131
IC101	EI-408645J	IC LC866008A-*** MXA1GE1
IN101	EM-408409J	IND FL 10-MT-44GK CHARACTER
IN102	EM-408410J	IND FL BJ035GK DOUBLE
PH101	ET-403246J	DETECTOR HC-377
TR102	ET-354414	TR DTC144ES
TR103	ET-356336	TR DTA114ES
TR105	ET-354364	TR DTC143TS
TR106	ET-361736	TR 2SC3576
TR107	ET-361736	TR 2SC3576
TR108	ET-354414	TR DTC144ES
TS101	ES-408641J	SW TACT EVQ 233 07K T05
TS102	ES-408641J	SW TACT EVQ 233 07K T05
TS103	ES-408641J	SW TACT EVQ 233 07K T05
TS104	ES-408641J	SW TACT EVQ 233 07K T05
TS105	ES-408641J	SW TACT EVQ 233 07K T05
TS106	ES-408641J	SW TACT EVQ 233 07K T05
TS107	ES-408641J	SW TACT EVQ 233 07K T05
TS108	ES-408641J	SW TACT EVQ 233 07K T05
TS109	ES-408641J	SW TACT EVQ 233 07K T05
TS110	ES-408641J	SW TACT EVQ 233 07K T05
TS111	ES-408641J	SW TACT EVQ 233 07K T05
TS112	ES-408641J	SW TACT EVQ 233 07K T05
TS113	ES-408641J	SW TACT EVQ 233 07K T05
W101	EW-408818J	CORD A6009 L=130 9P
W102	EW-408819J	CORD A6009 L=130 13P
W103	EW-408819J	CORD A6009 L=130 13P
X101	EI-408649J	OSC CE CST12.0MTW 12.000MHZ

## 7. GEQ P.C BOARD (TP-650)

Ref.No.	Part No.	Description
D201	ED-511907	D SILICON 1N4002 100/1.0A
D202	ED-511907	D SILICON 1N4002 100/1.0A
D203	ED-511907	D SILICON 1N4002 100/1.0A
D204	ED-511907	D SILICON 1N4002 100/1.0A
D205	ED-408807J	D ZENER H HZS12C3
D206	ED-408807J	D ZENER H HZS12C3
D207	ED-397103J	D ZENER H HZS6A1
FR201	*ER-331619	R FUSE H S10 ERD2FC 1/4W 39R0G
FR202	*ER-318248	R FUSE H S10 ERD2FC 1/4W 47R0G
IB201	EH-408650J	COMP R RYLS7J105 105J
IB202	EH-408650J	COMP R RYLS7J105 105J
IC201	EI-408647J	IC LC7522
IC202	EI-408648J	IC LA3607
IC203	EI-408648J	IC LA3607
IC204	EI-400756J	IC NJM4558L-B
IC205	EI-408646J	IC XR1091ECP
IC206	EI-332259	IC TC4052BP
TR201	ET-394735J	TR 2SC3792 T05
TR202	ET-394735J	TR 2SC3792 T05
TR203	ET-356336	TR DTA114ES
TR204	ET-354414	TR DTC144ES
TR205	ET-366581	TR 2SD1762 E,F
TR206	ET-400965J	TR 2SB1357 E,F T05
TR207	ET-353899	TR 2SA1317 S,T,U



## FINAL ASSEMBLY (TP-550)



TP-550/650

## 8. FINAL ASSEMBLY (TP-550)

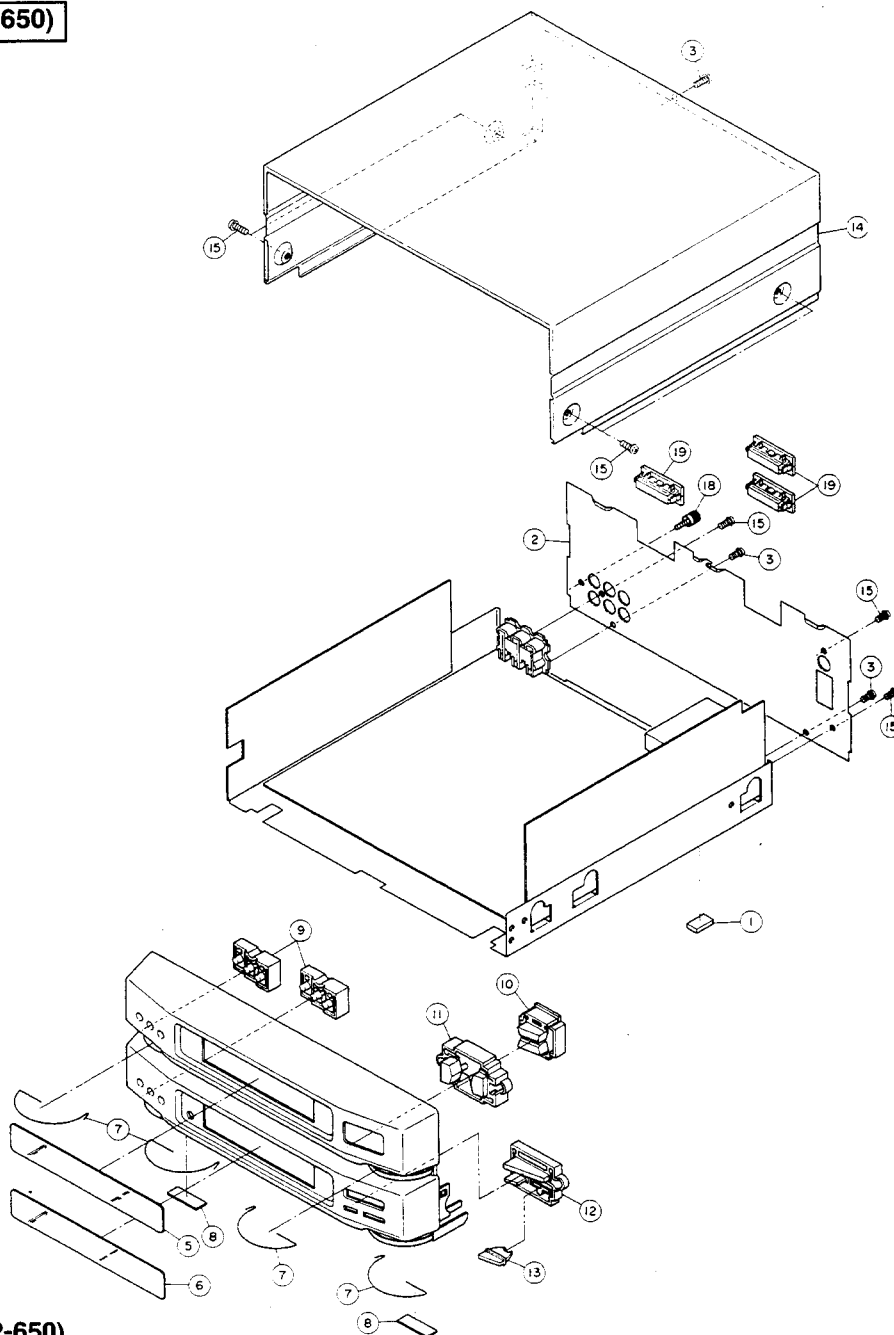
Ref.No.	Part No.	Description
1	SA-407840M	CUSHION FOOT REAR (SG)
2A	SP-407907M	PANEL REAR TP-550 (U) (SG)
2B	SP-407923M	PANEL REAR TP-550 (E) (SG)
2C	SP-407924M	PANEL REAR TP-550 (V) (SG)
3	ZS-308846	T2BR30X08STL BZN PROJECTION
4	SP-407897M	PANEL FRONT (SG)
5	SE-407903M	WINDOW-A (SG)
6	SE-407904M	WINDOW-B (SG)
7	SZ-407871M	RING FOOT (A) (SG)
8	SA-394136M	CUSHION FOOT (SG)
9	SB-407898M	BUTTON TIMER (SG)
10	SB-407900M	BUTTON-CH (SG)
11	SB-407901M	BUTTON-FR (SG)
12	SB-407899M	BUTTON SELECTOR (SG)

Ref.No.	Part No.	Description
14	SP-407906M	COVER UPPER (SG)
15	ZS-331182	BT BID30X08STL BNI
16	SE-407905M	LENS-SB (SG)
17	SK-407902M	KNOB TONE (SG)
18	EJ-393745J	TERMINAL W/SCREW UB-0132
19	SZ-407909M	WIRE HOLDER (SG)
20	SZ-407908M	REFLECTOR-SB (SG)

### NOTE:

Parts will not be supplied if they are not listed in the parts list, even if they appear on the assembling illustrations with reference No.

## FINAL ASSEMBLY (TP-650)



## 9. FINAL ASSEMBLY (TP-650)

Ref.No.	Part No.	Description
1	SA-407840M	CUSHION FOOT REAR (SG)
2A	SP-407925M	PANEL REAR TP-650 (U) (SG)
2B	SP-407926M	PANEL REAR TP-650 (E) (SG)
2C	SP-407927M	PANEL REAR TP-650 (V) (SG)
3	ZS-308846	T2BR30X08STL BZN PROJECTION
4	SP-407912M	PANEL FRONT (SG)
5	SE-407903M	WINDOW-A (SG)
6	SE-407915M	WINDOW-TP (SG)
7	SZ-407871M	RING FOOT (A) (SG)
8	SA-394136M	CUSHION FOOT (SG)
9	SB-407898M	BUTTON-TIMER (SG)
10	SB-407900M	BUTTON-CH (SG)
11	SB-407901M	BUTTON-FR (SG)
12	SB-407913M	BUTTON-SELECTOR (SG)
13	SB-407914M	BUTTON-SB (SG)
14	SP-407906M	COVER UPPER (SG)
15	ZS-331182	BT BID30X08STL BNI
18	EJ-393745J	TERMINAL W/SCREW UB-0132
19	SZ-407909M	WIRE HOLDER (SG)

### NOTE:

Parts will not be supplied if they are not listed in the parts list, even if they appear on the assembling illustrations with reference No.

## 10. ACCESSORY

Ref.No.	Part No.	Description
1	EE-394420M	ANT LOOP LA-75
2	EE-396107M	ANT WIRE FM A3063
3	EJ-394417J	SOCKET COAX HXC 0526-01-010

# INDEX

Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.
BAA6007T030A	2-1A	ED511907	4-D757	EO352089	3-T204	ET354371	4-TR816
BAA6007T030B	2-1B	ED511907	4-D758	EO353588	3-L301	ET354414	6-TR102
BAA6007T030C	2-1C	ED511907	4-D759	EO353588	3-L302	ET354414	6-TR108
BAA6007T030D	2-1D	ED511907	4-D761	EO357539	3-L101	ET354414	7-TR204
BAA6007T030E	2-1E	ED511907	4-D762	EO363279	3-T203	ET356336	4-TR817
BAA6007T030F	2-1F	ED511907	4-D765	EO408687J	3-T205	ET356336	6-TR103
BAA6007T040A	2-2	ED511907	4-D766	EO408689M	3-T101	ET356336	7-TR203
BAA6008T050A	2-3	ED511907	4-D767	EO408808M	3-T201	ET361736	6-TR106
EC337603	3-VC201	ED511907	4-D811	EO408809M	3-T202	ET361736	6-TR107
EC346868	4-C764	ED511907	4-D812	ER318248	7-FR202	ET366365	4-TR754
EC346868	4-C765	ED511907	4-D814	ER318647	3-R425	ET366365	4-TR756
EC346868	4-C766	ED511907	7-D201	ER324184	3-R107	ET366581	4-TR758
EC346868	4-C767	ED511907	7-D202	ER326169	4-R764	ET366581	7-TR205
EC356284	3-VC202	ED511907	7-D203	ER331619	7-FR201	ET369248	4-TR810
EC408691J	4-C801	ED511907	7-D204	ER333387	3-R108	ET373025	4-TR752
ED307572	3-D101	ED624903	6-D101	ER386215J	4-R751	ET373392	4-TR809
ED307572	3-D203	ED624903	6-D102	ER386215J	4-R752	ET394735J	3-TR202
ED307572	3-D204	ED624903	6-D103	ER386215J	4-R759	ET394735J	4-TR501
ED307572	3-D402	ED624903	6-D104	ER408692J	4-R765	ET394735J	4-TR502
ED307572	3-D403	EE394420M	10-1	ES362883	4-TS801	ET394735J	4-TR601
ED307572	3-D404	EE396107M	10-2	ES408641J	5-TS1	ET394735J	4-TR602
ED307572	4-D801	EE408686J	3-FE101	ES408641J	5-TS2	ET394735J	7-TR201
ED307572	4-D802	EH338338	3-FL102B	ES408641J	5-TS3	ET394735J	7-TR202
ED307572	4-D803	EH338338	3-FL103B	ES408641J	5-TS4	ET396072J	3-TR408
ED307572	4-D804	EH360924	3-FL101	ES408641J	5-TS5	ET397160J	3-TR102
ED307572	4-D805	EH364919	4-IB801	ES408641J	5-TS6	ET397160J	3-TR402
ED307572	4-D807	EH394759J	3-FL102A	ES408641J	5-TS7	ET397160J	4-TR512
ED307572	4-D808	EH394759J	3-FL103A	ES408641J	5-TS8	ET397160J	4-TR612
ED307572	4-D809	EH405199J	3-FL104	ES408641J	5-TS9	ET397160J	4-TR751
ED307572	4-D813	EH408650J	7-IB201	ES408641J	5-TS10	ET397160J	4-TR757
ED307572	4-D815	EH408650J	7-IB202	ES408641J	6-TS101	ET397160J	4-TR759
ED307572	4-D822	EH408815J	3-FL301	ES408641J	6-TS102	ET400965J	7-TR206
ED307572	5-D1	EH408815J	3-FL302	ES408641J	6-TS103	ET401091J	4-TR818
ED307572	5-D2	EI200573	4-IC502	ES408641J	6-TS104	ET401091J	4-TR819
ED307572	5-D3	EI200573	4-IC602	ES408641J	6-TS105	ET403246J	5-PH1
ED307572	5-D4	EI213390	3-IC301	ES408641J	6-TS106	ET403246J	6-PH101
ED307572	5-D5	EI302233	4-IC501	ES408641J	6-TS107	EV356576	3-VR102
ED307572	5-D6	EI302233	4-IC601	ES408641J	6-TS108	EV356576	3-VR103
ED307572	5-D10	EI332259	4-IC704	ES408641J	6-TS109	EV358829	3-VR101
ED307572	6-D105	EI332259	7-IC206	ES408641J	6-TS110	EV408642J	5-VR1
ED307572	6-D106	EI354951	3-IC401	ES408641J	6-TS111	EV408643J	5-VR2
ED307572	6-D107	EI368825M	4-X802	ES408641J	6-TS112	EW408676J	4-W1
ED307572	6-D108	EI382660J	4-IC701	ES408641J	6-TS113	EW408679J	4-W2
ED307572	6-D110	EI387938J	4-IC802	ET328265	3-TR101	EW408681J	4-W3
ED307572	6-D111	EI400756J	4-IC702	ET337759	3-TR401	EW408816J	5-W4
ED329058	4-D768	EI400756J	4-IC703	ET349458	3-TR201	EW408817J	5-W2
ED337990	4-D760	EI400756J	5-IC1	ET353897	3-TR203	EW408817J	5-W3
ED346531	4-D764	EI400756J	5-IC2	ET353897	4-TR806	EW408818J	6-W101
ED346534	4-D701	EI400756J	7-IC204	ET353897	4-TR811	EW408819J	6-W102
ED346534	4-D702	EI405327J	4-X801	ET353899	3-TR406	EW408819J	6-W103
ED346559	4-D755	EI408645J	6-IC101	ET353899	3-TR407	SA394136M	8-8
ED346560	4-D756	EI408646J	7-IC205	ET353899	4-TR753	SA394136M	9-8
ED351418	4-D763	EI408647J	7-IC201	ET353899	4-TR755	SA407840M	8-1
ED367576	3-D401	EI408648J	7-IC202	ET353899	4-TR760	SA407840M	9-1
ED370786	3-D405	EI408648J	7-IC203	ET353899	4-TR761	SB407898M	8-9
ED372893	3-D201	EI408649J	6-X101	ET353899	4-TR815	SB407898M	9-9
ED372893	3-D202	EI408672J	4-IC804	ET353899	5-TR1	SB407899M	8-12
ED389688J	3-D406	EI408673J	3-IC101	ET353899	7-TR207	SB407900M	8-10
ED397103J	7-D207	EI408674J	3-X101	ET354094	3-TR403	SB407900M	9-10
ED397289J	4-D821	EI408675J2	4-IC801	ET354094	3-TR404	SB407901M	8-11
ED408651J	5-D7	EI408814M	3-X401	ET354094	3-TR405	SB407901M	9-11
ED408651J	5-D8	EJ359031	3-TM1	ET354364	6-TR105	SB407913M	9-12
ED408651J	5-D9	EJ393745J	8-18	ET354370	4-TR808	SB407914M	9-13
ED408651J	6-D109	EJ393745J	9-18	ET354370	4-TR812	SE407903M	8-5
ED408807J	7-D205	EJ394417J	10-3	ET354371	4-TR801	SE407903M	9-5
ED408807J	7-D206	EJ408668J	4-J11B	ET354371	4-TR802	SE407904M	8-6
ED511907	4-D751	EJ408669J	4-J11A	ET354371	4-TR803	SE407905M	8-16
ED511907	4-D752	EM408409J	5-IN1	ET354371	4-TR804	SE407915M	9-6
ED511907	4-D753	EM408409J	6-IN101	ET354371	4-TR805	SK407902M	8-17
ED511907	4-D754	EM408410J	6-IN102	ET354371	4-TR807	SP407897M	8-4

TP-550/650

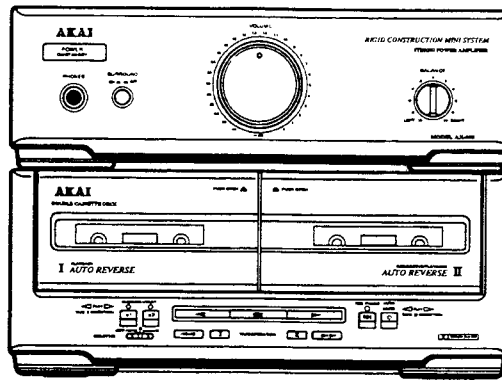
Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.
SP407906M	8-14						
SP407906M	9-14						
SP407907M	8-2A						
SP407912M	9-4						
SP407923M	8-2B						
SP407924M	8-2C						
SP407925M	9-2A						
SP407926M	9-2B						
SP407927M	9-2C						
SZ407871M	8-7						
SZ407871M	9-7						
SZ407908M	8-20						
SZ407909M	8-19						
SZ407909M	9-19						
ZS308846	8-3						
ZS308846	9-3						
ZS331182	8-15						
ZS331182	9-15						

## ABBREVIATIONS (TUNER)

ABBREVIATION	EXPLANATION	ABBREVIATION	EXPLANATION
AFC	Auto Frequency Control	MEMO	MEMOry
AGC	Auto Gain Control	MI-COM	Micro-COMputer
ALC	Auto Level Control	MIN	MINimum
AM	Amplitude Modulation	MIX	MIXing
AMP	AMPlifier	MPX	Multi pleX
ANT	ANTenna	MW	Medium Wave (frequency)
BATT	BATTery	NC	No Connection
BLK	BLock	NFB	Negative Feed Back
BUFF	BUFFer	OSC	OSCillator
COMP	COMPalator	PCB	Printed Circuit Board
DET	DETECT (DETctor)	PLL	Phase Locked Loop
FLD	FLUorescent Display	Q.D	Quadrature Detector
FM	Frequency Modulation	Rch	Right channel
FREQ	FREQuency	REF	REFerence
GND	GrouND	REG	REGulator
H	Hight	RF	Radio Frequency
HPF	Hight Pass Filter	SEG	SEGment
IF	Intermediate Frequency	SELE	SELEctor
IHF	Institut of High Fidelity	SENS	SENSitivity
IND	INDicator	SIG	SIGnal
I/O	In/Out	S/N	Signal to Noise Ratio
JW	Jumper Wire	SSG	Standard Signal Generator
L	Low	STD	STanDard
LCD	Liquid Crystal Display	SW	SWitch: Short Wave (frequency)
Lch	Left channel	THD	Total Harmonic Distortion
LED	Light Emiting Diode	TP	Test Point
LPF	Low Pass Filter	VCO	Voltage Controlled Cscillator
LW	Long Wave (Frequency)	VR	Variable Resistor
		X'TAL	Crystal

# MEMO

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**MODEL AX-650**

## STEREO DECK AMPLIFIER

# MODEL AX-550/650

## SPECIFICATIONS

### [AMPLIFIER section]

#### Power output

AX-550 .....	50W+50W (6 ohms, 1kHz, 10% THD, EIAJ), 35W+35W (6 ohms, 1kHz, 1% THD, DIN) 30W+30W (6 ohms, 60Hz to 20kHz, 0.5% THD, FTC)
AX-650 .....	60W+60W (6 ohms, 1kHz, 10% THD, EIAJ), 50W+50W (6 ohms, 1kHz, 1% THD, DIN) 40W+40W (6 ohms, 60 Hz to 20 kHz, 0.5% THD, FTC)

Music power output..... TOTAL 350W (AX-550), 430W (AX-650)

Peak music power output ..... TOTAL 600W (AX-550), 700W (AX-650)

Frequency response ..... 10Hz to 100kHz (10Hz: -4dB, 100kHz: -3dB)

Required speaker impedance .... 6 to 16 ohms (Front speaker), 8 to 16 ohms (Surround speaker)

#### Input Sensitivity

PHONO ..... 3mV/47k ohms

VCR..... 230mV/22k ohms

Output level ..... VCR 150mV/1k ohms

#### S/N ratio

PHONO ..... 61dB

ETC ..... 75dB

Residual noise..... 0.3mV

Channel separation ..... 65dB

### [Deck section]

Track system ..... 4 track, 2 channel system

Frequency response ..... 35 to 14,000Hz  $\pm$  3dB (Normal tape)

35 to 15,000Hz  $\pm$  3dB (CrO<sub>2</sub> tape)

Wow & Flutter ..... 0.09% (WRMS), 0.15% (DIN)

S/N ratio ..... 76dB (Dolby C ON, 1 kHz to 10 kHz)

66dB (Dolby B ON, 5 kHz)

56dB (Dolby OFF, CrO<sub>2</sub> tape)

Total harmonic distortion ..... less than 0.3% (Normal tape, at 315Hz)

Channel separation ..... 35dB (Normal tape)

### [General]

Power requirements ..... AC220V-230V, 50Hz for Europe except UK, AC240V, 50Hz for UK & Australia  
AC110V/120V/220V/240V, 50/60Hz convertible for other countries

Demensions ..... 270(W) x 200(H) x 313(D)mm

Weight ..... 7.0kg


Power consumption..... 110W (AX-550), 140W (AX-650)

### Standard accessories

Remote control unit..... x 1

Batteries ..... x 2

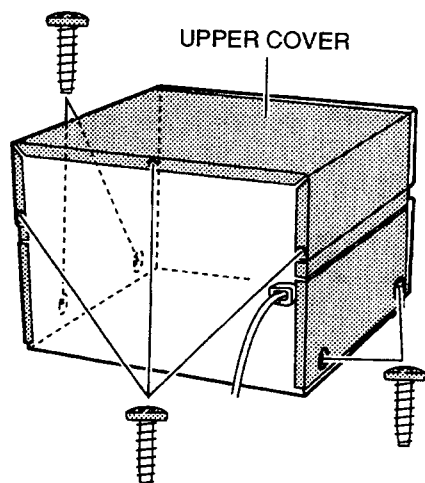
Operator's manual ..... x 1

- \* For improvement purposes, specifications and design are subject to change without notice.
- \* Noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.
- "DOLBY" and  symbol are trademarks of Dolby Licensing Corporation.

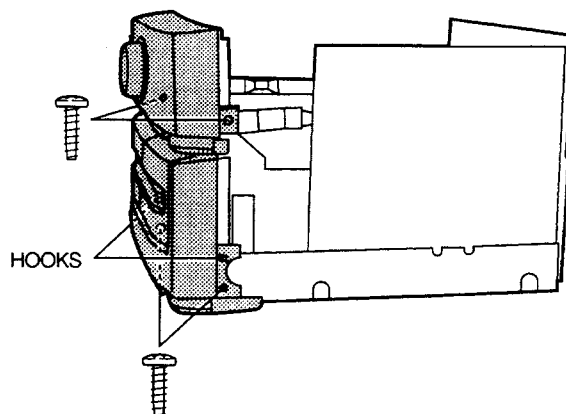
# I.DISASSEMBLY

In case of trouble etc., necessitating dismantling, please dismantle in the order shown in the illustrations. Reassemble in the reverse order.

## 1. Removal of the UPPER COVER

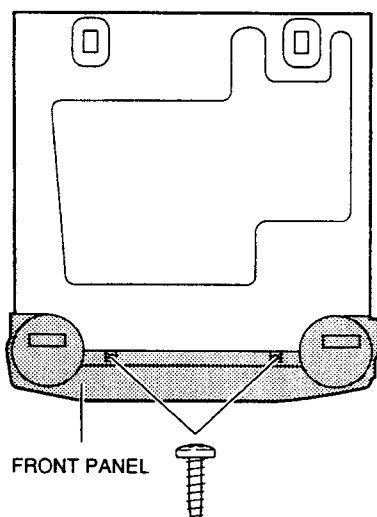


3.

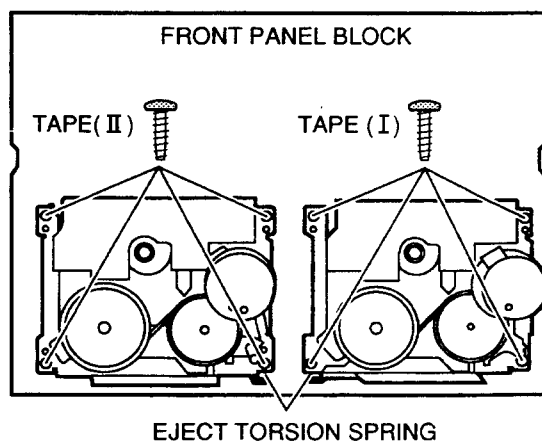


- 1) Disconnect the wires from J4 and J8 connectors on the POWER SUPPLY PCB, P101,P102,J651,J652,J801 and J802 on the DECK PCB, J2 on the MAIN AMP PCB.

## 2. Removal of the FRONT PANEL BLOCK



## 4. Removal of the CASSETTE MECHA BLOCK



- 1) Unhook the EJECT TORSION SPRING.
- 2) Remove the four MECHA BLOCK RETAINING SCREWS.



## II. PRINCIPAL PARTS LOCATION

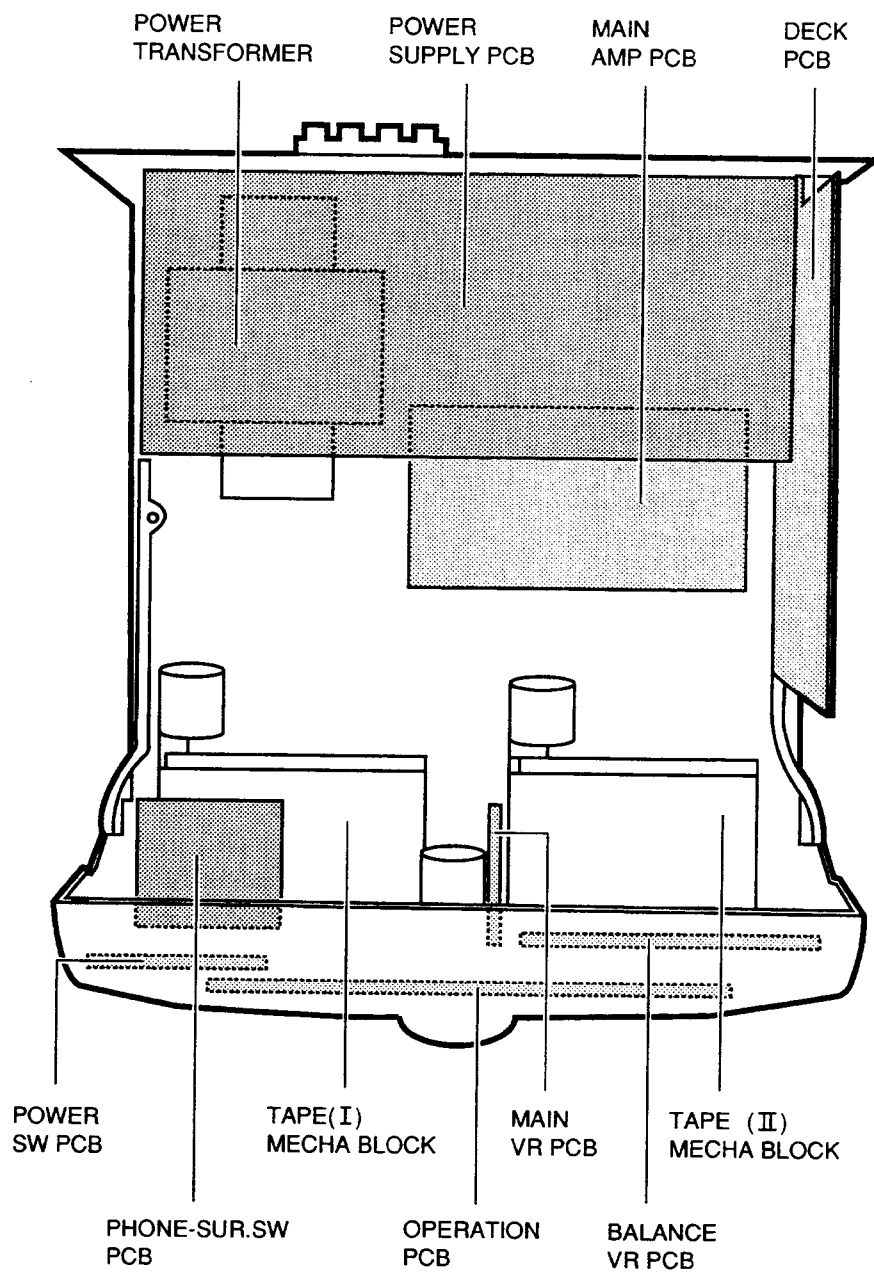


Fig.2-1 Top view

# III.REPLACEMENT OF PRINCIPAL MECHANICAL PARTS

## 3-1.REPLACEMENT OF THE PINCH ROLLER BLOCK

- 1) Pull the PINCH ROLLER BLOCK upward (▲) while releasing the PINCH ROLLER RETAINING HOOK
- 2) Reassemble in the reverse order.

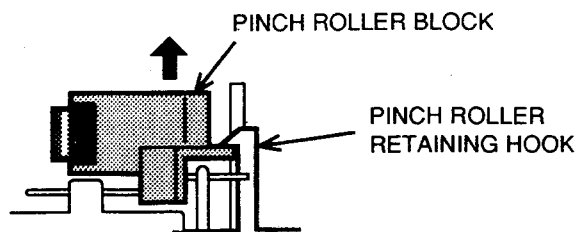


Fig.3-1

## 3-2.REPLACEMENT OF THE PB HEAD (TAPE I)

- 1) Remove the two HEAD RETAINING (A) SCREWS.
- 2) Pull out the HEAD and disconnect all the lead wires with a soldering iron, then replace the PB HEAD.
- 3) Reassemble in the reverse order. After replacement, head azimuth and PB level (AX-650 only) adjustment must be performed.

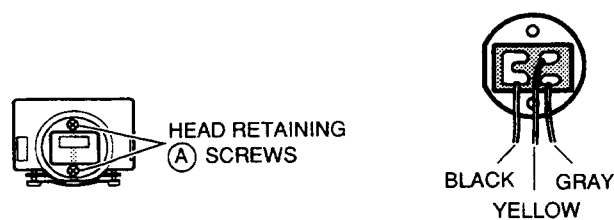


Fig.3-2

Fig.3-3

## 3-3.REPLACEMENT OF THE REC/PB HEAD (TAPE II)

- 1) Remove the two HEAD RETAINING (A) SCREWS.
- 2) Pull out the HEAD and disconnect all lead wires with a soldering iron, then replace the REC/PB HEAD.
- 3) Reassemble in the reverse order. After replacement, head azimuth, PB level (AX-650 only), BIAS current (AX-650 only) and REC level (AX-650 only) adjustments must be performed.

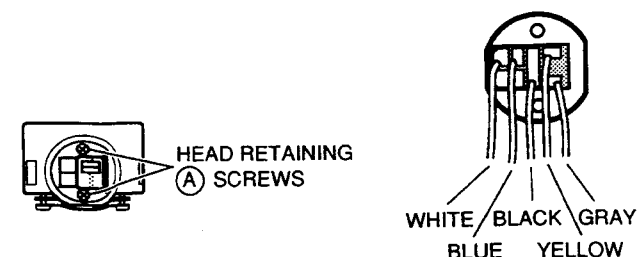


Fig.3-4

Fig.3-5

## 3-4.REPLACEMENT OF THE CAPSTAN MOTOR

- 1) Disconnect the lead wire of the CAPSTAN MOTOR with a soldering iron.
- 2) Remove the CAPSTAN MOTOR RETAINING (B) SCREWS, then replace the CAPSTAN MOTOR.
- 3) Reassemble in the reverse order and set the DRIVE BELT. After replacement, tape speed adjustment must be performed.

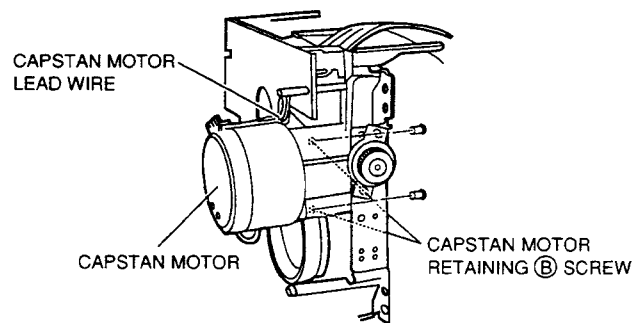


Fig.3-6

## 3-5.REPLACEMENT OF THE DRIVE BELT

- 1) Remove the CAPSTAN MOTOR RETAINING (B) SCREWS. (refer illustration Fig.3-6)
- 2) Unsolder the lead wires of the SOLENOID with a soldering iron.
- 3) Remove the two MOTOR PCB RETAINING (C) SCREWS and separate the MOTOR PCB from the MECHA BLK. Replace the DRIVE BELT.
- 4) Reassemble in the reverse order. After replacement, confirm the tape speed and if the result is not satisfactory, adjust the tape speed.

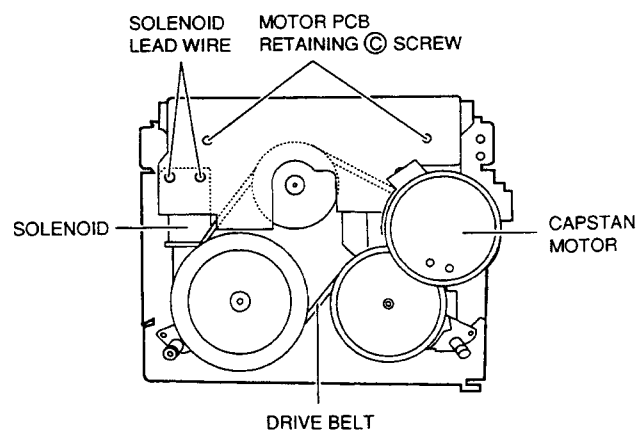


Fig.3-7

## IV.MECHANICAL ADJUSTMENT

### 4-1.ADJUSTMENT OF THE PB HEAD AZIMUTH ALIGNMENT (TAPE I)

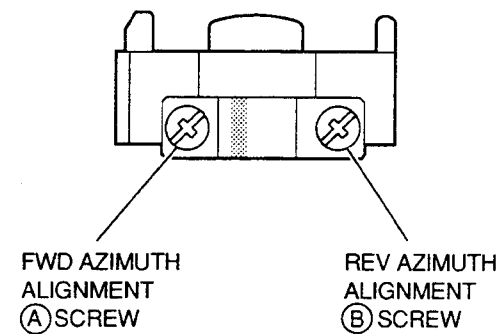


fig.4-1

- 1) Connect an AC milli-voltmeter to the TEST POINT 1L and 1R (refer to the illustration on page 24) and connect an oscilloscope's input CH-1 and CH-2 to the output of the AC milli-voltmeters.
- 2) Play back the 10 kHz (~15 dB), HEAD AZIMUTH ALIGNMENT TEST TAPE (TF-106CH) then adjust the PB HEAD AZIMUTH ALIGNMENT (A) (FWD PLAY) and (B) (REV PLAY) SCREW respectively so that the reading on the AC milli-voltmeters are at maximum and waveforms on the oscilloscope are in the same phase, in both FWD and REV directions.

### 4-2.ADJUSTMENT OF THE REC/PB HEAD AZIMUTH ALIGNMENT (TAPE II)

- 1) Connect an AC milli-voltmeter to the TEST POINT 1L and 1R (refer to the illustration on page 24) and connect the oscilloscope's input CH-1 and CH-2 to the output of the AC milli-voltmeters.
- 2) Play back the 10 kHz (~15dB), HEAD AZIMUTH ALIGNMENT TEST TAPE (TF-106CH) then adjust the REC/PB HEAD AZIMUTH ALIGNMENT (A) (FWD PLAY) and (B) (REV PLAY) SCREW respectively so that the reading on the AC milli-voltmeters are at maximum and waveforms on the oscilloscope are in the same phase in both FWD and REV directions.

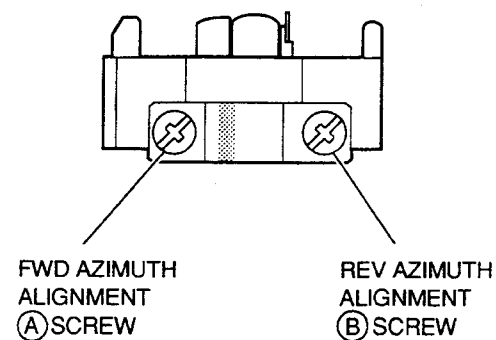


Fig.4-2

AX-550/650

V. ELECTRICAL ADJUSTMENT

**NOTE:**

1) The following adjustment should be performed in the test mode.  
To engage the test mode, connect the AC power cord to the AC outlet while pressing the ►► and ◄◄ buttons together.  
When the test mode is engaged, X1 dub lamp is lit.

2) When performing the tape speed adjustment, observe the following notes.

- Adjustment should be started more than 30 seconds after the power is ON.
- Adjustment should be made on X2 speed mode first then adjust normal speed mode.
- Adjustment should be made in the forward direction.

3) An AC milli-volt meter input should be terminated with 20k ohms register in parallel.

**1 TAPE I (X2) TAPE SPEED**

1. 3,150Hz test tape (TF-110CT)  
2. PLAY (press the x2 DUBBING START button)  
3. TEST POINT 1L, VR651  
4. •Connect a frequency counter to the TEST POINT 1L.  
\*6,300 ± 20 Hz

**2 TAPE I NORMAL TAPE SPEED**

1. 3,150Hz test tape (TF-110CT)  
2. PLAY  
3. TEST POINT 1L, VR653  
4. •Connect a frequency counter to the TEST POINT 1L.  
\*3,150 ± 10Hz

**3 TAPE II (X2) TAPE SPEED**

1. 3,150Hz test tape (TF-110CT)  
2. PLAY (press the x2 DUBBING START button)  
3. TEST POINT 1L, VR654  
4. •Connect a frequency counter to the TEST POINT 1L.  
\*6,300 ± 20Hz

**4 TAPE II NORMAL TAPE SPEED**

1. 3,150Hz test tape (TF-110CT)  
2. PLAY  
3. TEST POINT 1L, VR652  
4. •Connect a frequency counter to the TEST POINT 1L.  
\*3,150 ± 10Hz

**STEP ADJUSTMENT**

1. TEST TAPE/INPUT SIGNAL  
2. MODE  
3. CHECK POINT, ADJUSTMENT PART  
4. REMARKS (●) and RESULT (\*)

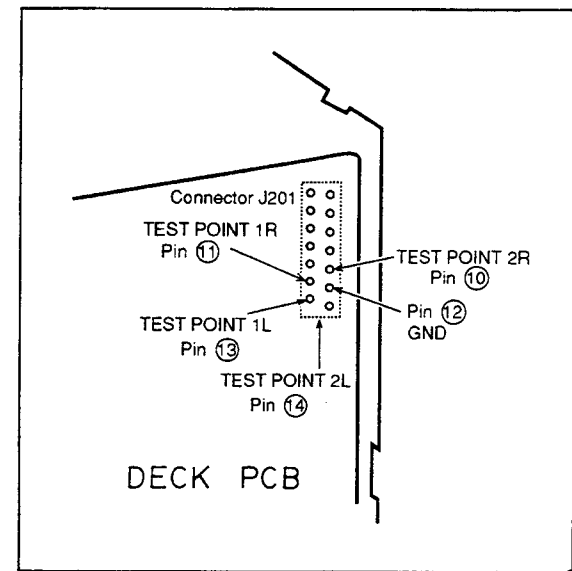
Adjustment Part  
Test Point

**6 TAPE II PB LEVEL (AX-650 ONLY)**

1. 315Hz test tape (TF-101CL)  
2. PLAY  
3. TEST POINT 1L & 1R, VR102 (L-ch) / VR152 (R-ch)  
4. •Connect an AC milli-voltmeter to the TEST POINT 1L & 1R.  
\*-6.0dBs

**5 TAPE I PB LEVEL (AX-650 ONLY)**

1. 315Hz test tape (TF-101CL)  
2. PLAY  
3. TEST POINT 1L & 1R, VR101 (L-ch) / VR151 (Rch)  
4. •Connect an AC milli-voltmeter to the TEST POINT 1L & 1R.  
\*-6.0dBs



**9 RECORDING LEVEL (AX-650 ONLY)**

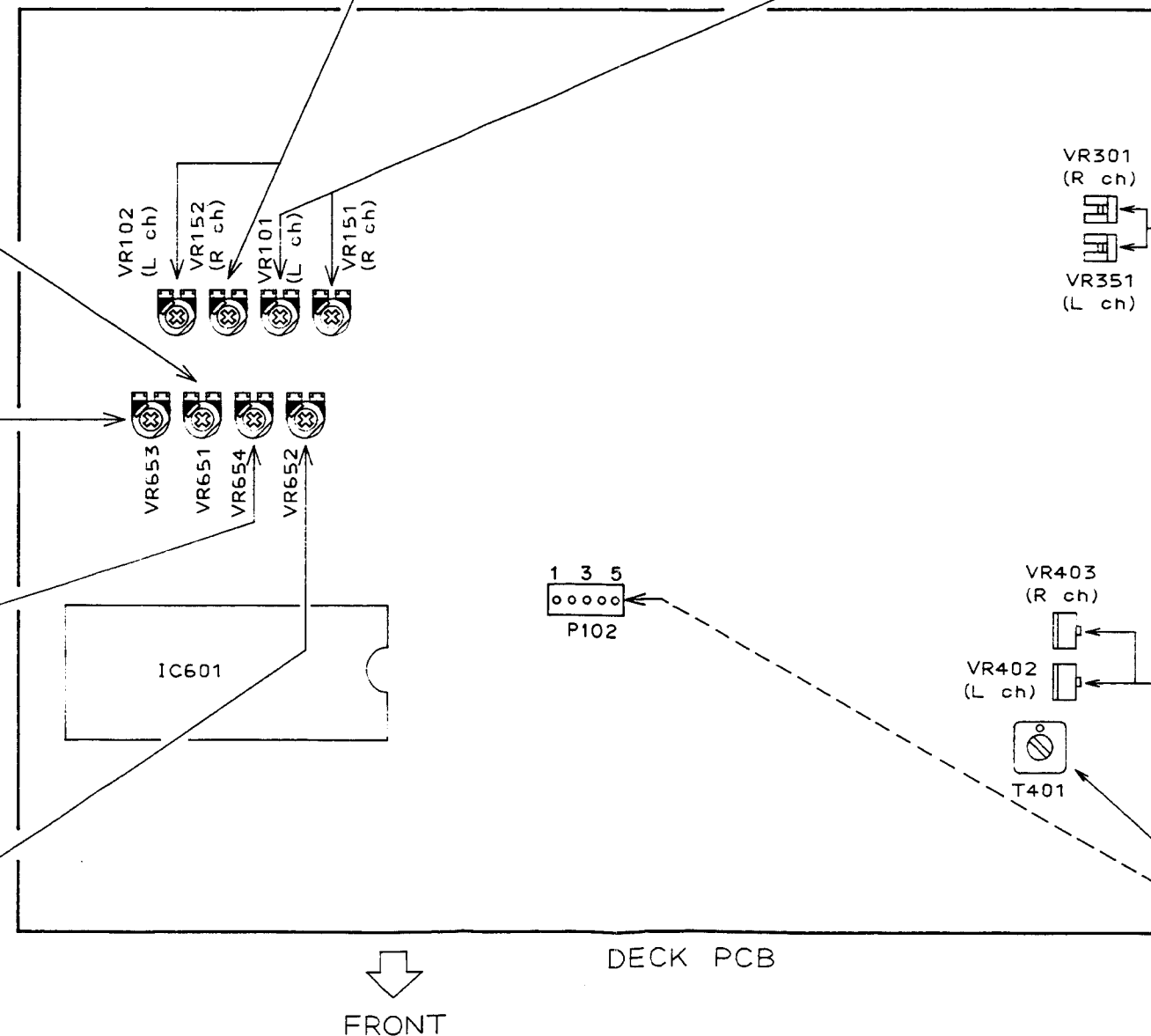
1. 1 kHz, -6.0 dBs (LINE OUT), NORMAL recording test tape (UD-124)  
2. REC → PLAY  
3. TEST POINT 1L & 1R, VR351 (L-ch) / VR301 (R-ch)  
4. •Connect an AC Milli-voltmeter to the TEST POINT 1L & 1R.  
•Connect an audio signal generator to the TEST POINT 2L & 2R and set the generator level so that the TEST POINT 1L & 1R levels are -6.0 dBs.  
\*Playback levels after recording are -6.0dBs

**8 NORMAL POSITION BIAS (AX-650 ONLY)**

1. 1 kHz and 10 kHz, -26.0 dBs (LINE OUT), NORMAL recording test tape (UD-124).  
2. REC → PLAY  
3. TEST POINT 1L & 1R, VR402 (L-ch) / VR403 (R-ch)  
4. •Connect an AC Milli-voltmeter to the TEST POINT 1L & 1R.  
•Connect an audio signal generator to the TEST POINT 2L & 2R and set the generator level so that the TEST POINT 1L & 1R levels are -26.0 dBs.  
\*Playback level difference between 1kHz and 10kHz after recording is within ± 0.3dB.

**7 BIAS OSC FREQUENCY**

1. CrO2 type blank tape  
2. REC  
3. TAPE II, T401 (P102)  
4. •Connect a frequency counter between P102 ⑤ pin and GND.  
\*100.0 ± 0.2kHz



## VI. PARTS LIST

### ATTENTION

1. When placing an order for parts, be sure to list Part No., Model No. and the description of each part. Otherwise, the non-delivery of the part or the delivery of a wrong part may result.
2. Please make sure that Part No. is correct when ordering.  
If not, a part different from the one you ordered may be delivered.
3. Since the parts shown in Parts List of Preliminary Service Manual may have been the subject of changes, please use this Parts List for all future reference.

### HOW TO USE THIS PARTS LIST

1. This Parts List lists those parts which are considered necessary for repairs. Other common parts, such as resistors and capacitors, are listed in the "Common List for Service Parts" from which these parts should be selected and stocked.
2. The Recommended Spare Parts List shows those parts in the Parts List which are considered particularly important for service.
3. Parts not shown in the Parts List and "Common List for Service Parts" will not in principle be supplied.
4. How to read the Parts List.

#### a) Mechanism Block

### 2. HEAD BASE BLOCK

Ref. No.	Part No.	Description
1	BH-T2023A320A	HEAD BASE BLOCK
2	HP-H2206A010A	HEAD R/P PR4-8FU C
3	ZS-477876	PAN20×03STL CMT
4	ZS-536488	BID20×08STL CMT
5	ZG-402895	SP CS ANGLE ADJUST

SP (Service Parts) Classification

This number corresponds with the individual parts index number in that figure.

#### b) PC Board

### 6. MAIN PC BOARD

Ref. No.	Part No.	Description
IC1	EI-324536	IC HD14049BP
IC2	EI-336801	IC MB8841-564M
C1A	EC-338399	C MMY V 223M 250AC [U,E,B,S]
C1B	EC-350949	C MMY V 223M 250DC [J]
C1C	EC-338397	C MMY V 223M 125AC [C,A]
X1	EI-318384	OSC X'TAL NC-18C

Symbols for primary destination

[A] : AAL (U.S.A) [S] : SAA (Australia)  
[B] : BEAB (England) [U] : U/T (Universal Area)  
[C] : CSA (Canada)  
[E] : CEE (Europe) [V] : VDE (Germany)  
[J] : JPN (Japan) [Y] : Custom Version

SP (Service Parts) Classification

These reference symbols correspond with component symbols in the Schematic Diagrams.

The available PC Board Blocks are listed separately.

5. When Part No. is known, Parts Index at end of Parts List can be used to locate where that part is shown in Parts List by its Reference No. listed at right of Part No.

### WARNING

⚠ (\*) INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURE'S RECOMMENDED PARTS.

### AVERTISSEMENT

⚠ (\*) IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT.

## 1.RECOMMENDED SPARE PARTS

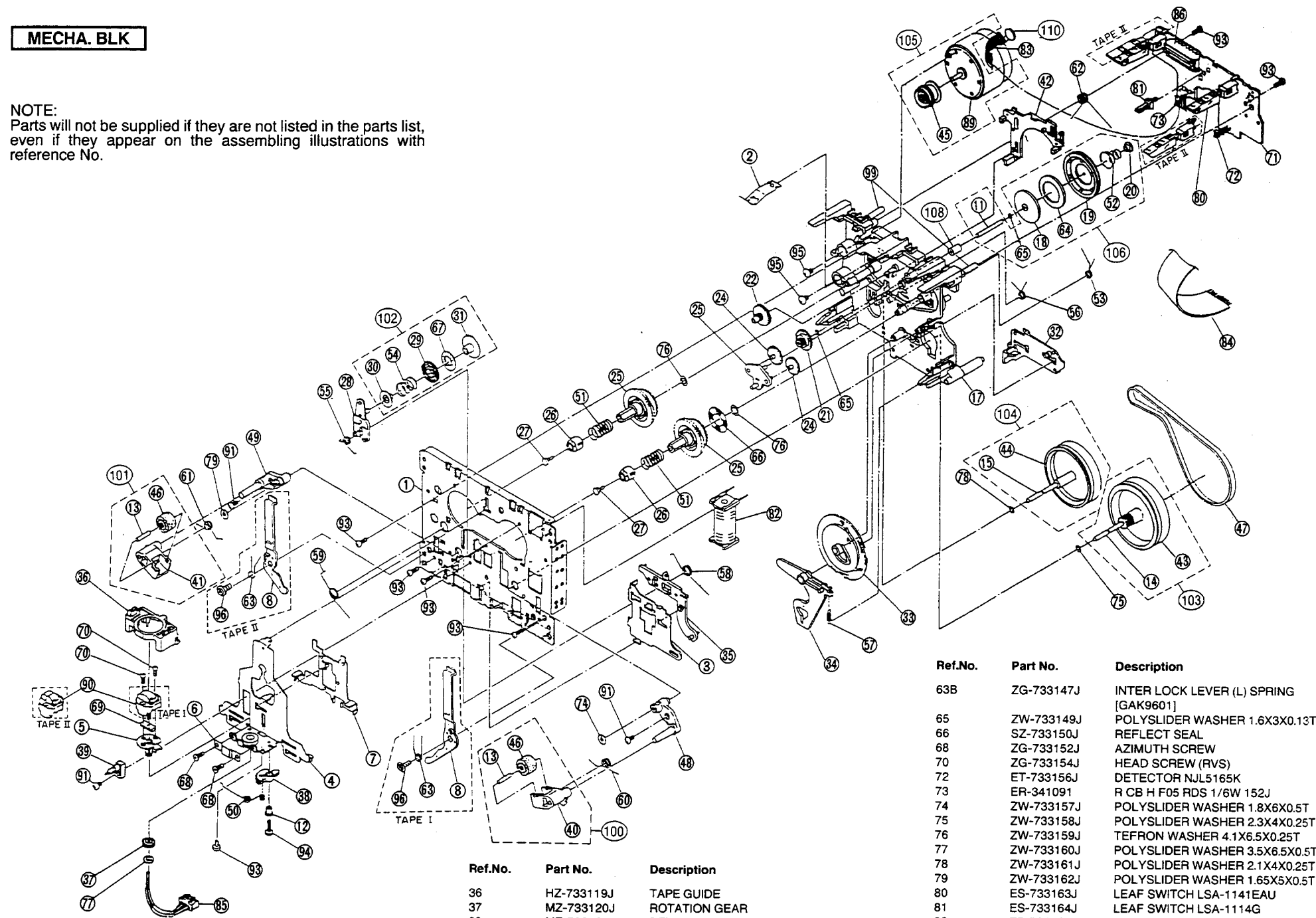
We suggest you to stock the following Recommended Spare Part items listed below since they can cover most of the routine service.

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
1	AX-408738M	REMOCON RC-S650	53	ET-369248	TR DTA114YS
2	BB-408737M	MECHA GAK9301 [TAPE 1]	54	ET-375983	TR DTA124TS
3	BB-408736M	MECHA GAK9601 [TAPE 2]	55	ET-373382	TR DTA143ZS
4	BM-729992J	MOTOR EG530KD-2B	56	ET-373985	TR DTA144TS
5	*BT-408729M	TRANS POW C1029 BS [550]	57	ET-354365	TR DTC114YS
6	*BT-408728M	TRANS POW C1029 EV [550]	58	ET-373485	TR DTC123JS
7	*BT-408727M	TRANS POW C1029 U [550]	59	ET-375986	TR DTC124TS
8	*BT-408732M	TRANS POW C1030 BS [650]	60	ET-354364	TR DTC143TS
9	*BT-408731M	TRANS POW C1030 EV [650]	61	ET-373391	TR DTC143ZS
10	*BT-408730M	TRANS POW C1030 U [650]	62	ET-354414	TR DTC144ES
11	ED-394509J	D LED GL3HY43 ORANGE	63	ET-370310	TR DTC144TS
12	ED-394724J	D LED GL3PR43 RED	64	ET-408777J	TR FET 2SJ40 D,E T05
13	ED-307572	D SILICON H 1SS131	65	ET-408709J	TR FET 2SK373 Y,GR T05
14	*ED-394708J	D SILICON RBA402 200/4.0A	66	ET-348302	TR FET 2SK381 C,D F05
15	ED-511907	D SILICON 1N4002 100/1.0A	67	ET-353899	TR 2SA1317 S,T,U
16	ED-408743J	D ZENER H HZS11B3L	68	ET-408772J	TR 2SA1318 S,T,U T05
17	ED-388320J	D ZENER H HZS12B3L	69	*ET-352726	TR 2SA1392 T,U
18	ED-391003J	D ZENER H HZS4C3	70	ET-397160J	TR 2SC3330 R,S,T,U,V
19	ED-400171J	D ZENER H HZS6C2L	71	ET-361736	TR 2SC3576
20	*EF-359007	FUSE BET T 250V 1.25A [U.B.S] [550]	72	ET-400741J	TR 2SC3708 T T05
21	*EF-364518	FUSE BET T 250V 2.50A [550]	73	*ET-366581	TR 2SD1762 E,F
22	*EF-359225	FUSE BET T 250V 3.15A [650]	74	*ET-373025	TR 2SD1944 J1,J2,K
23	*EF-359086	FUSE BET T 250V 4.00A [650]	75	ET-396072J	TR 2SD2159 V,W
24	*EF-358974	FUSE BET T 250V 630MA	76	EV-394561J	R S-FIX H V8K4-11 (1S) 0.10W102
25	*EF-601964	FUSE SEMKO T 250V 1.60A [U.B.S] [650]	77	EV-404323J	R S-FIX H V8K4-11 (1S) 0.10W332 [650]
26	EH-408820J	COMP R RGL10T 472J	78	EV-367524	R S-FIX H V8K4-11 (1S) 0.10W501
27	EI-389322J	IC CXA1101P [550]	79	EV-341249	R S-FIX V TM8KH1-1S 0.50W303 [650]
28	EI-394573J	IC CXA1331S [650]	80	EV-403967J	R S-FIX V T05EVNDCAA03 0.1W332 [650]
29	EI-387938J	IC HD74LS05P	81	EV-408707J	VR ROTARY RK11K1140 SP W104 [BALANCE VR]
30	EI-394574J	IC LA2000	82	EV-408811J	VR SPL RK16EUWMZ1 B104X2 [MAIN VR]
31	EI-393323J	IC M5218AL-771	83	EW-733168J	3P HEAD WIRE ASSY [GAK9301]
32	*EI-394709J	IC STK4142-2 [550]	84	EW-733169J	5P HEAD WIRE ASSY [GAK9601]
33	*EI-358554	IC STK4152II [650]	85	HP-733172J	ROTATION HEAD MK10P-AB2N3 [GAK9301]
34	EI-310036	IC TC4066BP	86	HR-733173J	ROTATION HEAD YK56R-AA4N3 [GAK9601]
35	EI-408700J	IC UPD75108CW-W03 MXA1DK1	87	HZ-733119J	TAPE GUIDE
36	EI-373957J1	OSC CE CST4.19MGW 4.194MHZ	88	MB-733130J	DRIVE BELT (A)
37	EO-337880	COIL FIX 2 202AK-018 2R2K	89	MR-733129J	P ROLLER
38	EO-408702J	COIL TUN 1 100Z-121 100.00KHZ	90	MZ-733132J	HOUSING ASSY (L)
39	EP-733165J	SOLENOID ASSY	91	MZ-733131J	HOUSING ASSY (R)
40	*ER-331188	R FUSE H S10 ERD2FC 1/4W 8R2J			
41	*ER-401042J	R FUSE V T05 ERD2FCV 1/4W33R0G			
42	*ER-408716J	R FUSE V T05 ERD2FCV 1/4W56R0G			
43	ER-397193J	R OMF V T05 FS 1W 100J			
44	ER-397194J	R OMF V T05 FS 1W 331J			
45	ES-733164J	LEAF SWITCH LSA-1114G			
46	ES-733163J	LEAF SWITCH LSA-1141EAU			
47	ES-408695J	SW PUSH SPUL12 2-02-02N [SURROUND SW]			
48	*ES-349070	SW SELECTOR YKS11-0002 02-4			
49	ES-408706J	SW SLIDE SSSS91 L=2 1-01-02N [550]			
50	ES-408708J	SW SLIDE SSSS91 L=2 1-01-03 [650]			
51	ES-408703J	SW TACT EVQ 233 05R T05 [POWER SW]			
52	ET-733156J	DETECTOR NUL5165K			

# MECHA. BLK

## NOTE:

Parts will not be supplied if they are not listed in the parts list, even if they appear on the assembling illustrations with reference No.



## 2. MECHA BLK

Ref.No.	Part No.	Description
2	ZG-733087J	PACK SPRING
3	ML-733088J	SHIFT LEVER
5	HZ-733090J	HEAD PLATE ASSY
6	ZG-733091J	AZIMUTH SPRING
12	MZ-733096J	COLLAR
13	MS-733097J	PINCH ROLLER ARM SHAFT
21	MZ-733104J	CLUTCH GEAR
22	MZ-733105J	REW GEAR
23	ML-733106J	ER ARM
24	MZ-733107J	FR GEAR
25	MZ-733108J	REEL GEAR
26	MT-733109J	REEL CAP (A)
27	MT-733110J	REEL BUSH (B)
28	ML-733111J	PLAY ARM
32	ML-733115J	SHIFT LEVER SELECT
33	MZ-733116J	PLAY CAM GEAR
34	ML-733117J	TRIGGER ARM
35	ML-733118J	SELECT ARM

Ref.No.	Part No.	Description
36	HZ-733119J	TAPE GUIDE
37	MZ-733120J	ROTATION GEAR
38	MZ-733121J	RETURN GEAR
39	MS-733122J	CASSETTE GUIDE
40	ML-733123J	P ROLLER ARM (R)
41	ML-733124J	P ROLLER ARM (L)
42	ML-733125J	BRAKE ARM
45	MR-733128	MOTOR PULLEY
46	MR-733129J	P ROLLER
47	MB-733130J	DRIVE BELT (A)
48	MZ-733131J	HOUSING ASSY (R)
49	MZ-733132J	HOUSING ASSY (L)
50	ZG-733133J	RETURN SPRING
51	ZG-733134J	REEL SPRING
53	ZG-733136J	CLUTCH ARM SPRING
55	ZG-733138J	PLAY ARM SPRING
56	ZG-733139J	SHIFT LEVER SELECT SPRING
57	ZG-733140J	TRIGGER ARM SPRING
58	ZG-733141J	SHIFT SPRING
59	ZG-733142J	HEAD CHASSIS SPRING
60	ZG-733143J	P ROLLER ARM (R) SPRING
61	ZG-733144J	P ROLLER ARM (L) SPRING
62	ZG-733145J	BRAKE ARM SPRING
63A	ZG-733146J	INTER LOCK LEVER (R) SPRING [GAK9301]

Ref.No.	Part No.	Description
63B	ZG-733147J	INTER LOCK LEVER (L) SPRING [GAK9601]
65	ZW-733149J	POLYSLIDER WASHER 1.6X3X0.13T
66	SZ-733150J	REFLECT SEAL
68	ZG-733152J	AZIMUTH SCREW
70	ZG-733154J	HEAD SCREW (RVS)
72	ET-733156J	DETECTOR NJL5165K
73	ER-341091	R CB H F05 RDS 1/6W 152J
74	ZW-733157J	POLYSLIDER WASHER 1.8X6X0.5T
75	ZW-733158J	POLYSLIDER WASHER 2.3X4X0.25T
76	ZW-733159J	TEFRON WASHER 4.1X6.5X0.25T
77	ZW-733160J	POLYSLIDER WASHER 3.5X6.5X0.5T
78	ZW-733161J	POLYSLIDER WASHER 2.1X4X0.25T
79	ZW-733162J	POLYSLIDER WASHER 1.65X5X0.5T
80	ES-733163J	LEAF SWITCH LSA-1141EAU
81	ES-733164J	LEAF SWITCH LSA-1114G
82	EP-733165J	SOLENOID ASSY
84	EW-733167J	15P FLAT RIBBON WIRE
85A	EW-733168J	3P HEAD WIRE ASSY [GAK9301]
85B	EW-733169J	5P HEAD WIRE ASSY [GAK9601]
86	EJ-733170J	CONNECTOR 52004-1510
89	BM-729992J	MOTOR EG530KD-2B
90A	HP-733172J	ROTATION HEAD MK10P-AB2N3 [GAK9301]
90B	HR-733173J	ROTATION HEAD YK56R-AA4N3 [GAK9601]
91	ZS-460440	PAN20X04STL CMT
93	ZS-321320	BT PAN20X06STL CMT
94	ZS-733174J	TAPPING SCREW 1.7X8
95	ZS-432843	PAN26X04STL CMT
96	ZS-733175J	WASHER HEAD SCREW 20X6
99	MA-733176J	MECHA BASE ASSY
102	BZ-733179J	PLAY GEAR ASSY
103	BF-733191J	FLYWHEEL (R) ASSY
104	BF-733192J	FLYWHEEL (L) ASSY
106	BZ-733194J	CLUTCH ASSY
110	EC-322028	C CE V F05 SL 101J 50DC

## PARTS LIST

AX-550/650

3. P.C BOARD BLK

Ref.No.	Part No.	Description
1A	BA-C1029T050A	ML PC (#) MAIN-AXBLKAX-550 (U) /ML [U]
1B	BA-C1029T050B	ML PC (#) MAIN-AXBLKAX-550 (E) /ML [E]
1C	BA-C1029T050C	ML PC (#) MAIN-AXBLKAX-550 (V) /ML [V]
1D	BA-C1029T050D	ML PC (#) MAIN-AXBLKAX-550 (B) /ML [B,S]
1E	BA-C1029T050E	ML PC (#) MAIN-AXBLKAX-650 (U) /ML [U]
1F	BA-C1029T050F	ML PC (#) MAIN-AXBLKAX-650 (E) /ML [E]
1G	BA-C1029T050G	ML PC (#) MAIN-AXBLKAX-650 (V) /ML [V]
1H	BA-C1029T050H	ML PC (#) MAIN-AXBLKAX-650 (B) /ML [B,S]
2A	BA-C1029T060A	ML PC (#) DECK-AXBLKAX-550/ML
2B	BA-C1029T060B	ML PC (#) DECK-AXBLKAX-650/ML

PC (#) MAIN-AX BLK CONSISTS OF FOLLOWING P.C BOARD.

- MAIN AMP P.C BOARD
- POWER SUPPLY P.C BOARD
- BALANCE VR P.C BOARD
- MAIN VR P.C BOARD
- PHONE/SUR P.C BOARD
- POWER SW P.C BOARD
- LED P.C BOARD

PC (#) DECK-AX BLK CONSISTS OF FOLLOWING P.C BOARD.

- MAIN P.C BOARD
- OPERATION P.C BOARD

4. MAIN ANP P.C BOARD

Ref.No.	Part No.	Description
C83A	EC-383075J	C EC V CUT SME 332M 35.0DC [550]
C83B	EC-394535J	C EC V CUT SME 332M 45.0DC [650]
C84A	EC-383075J	C EC V CUT SME 332M 35.0DC [550]
C84B	EC-394535J	C EC V CUT SME 332M 45.0DC [650]
D1	*ED-394708J	D SILICON RBA402 200/4.0A
D2	ED-511907	D SILICON 1N4002 100/1.0A
D3	ED-511907	D SILICON 1N4002 100/1.0A
D4	ED-307572	D SILICON H 1SS131
D5	ED-388320J	D ZENER H HZS12B3L
D6	ED-307572	D SILICON H 1SS131
D7	ED-307572	D SILICON H 1SS131
D8	ED-511907	D SILICON 1N4002 100/1.0A
FR1	*ER-331188	R FUSE H S10 ERD2FC 1/4W 8R2J
FR2	*ER-408716J	R FUSE V T05 ERD2FCV 1/4W56R0G
IC1A	*EI-394709J	IC STK4142-2 [550]
IC1B	*EI-358554	IC STK4152II [650]
L1	EO-337880	COIL FIX 2 202AK-018 2R2K
L2	EO-337880	COIL FIX 2 202AK-018 2R2K
R9	ER-397193J	R OMF V T05 FS 1W 100J
R10	ER-397193J	R OMF V T05 FS 1W 100J
R59	ER-397193J	R OMF V T05 FS 1W 100J
R60	ER-397193J	R OMF V T05 FS 1W 100J
TR1	ET-354365	TR DTC114YS
TR2	ET-375983	TR DTA124TS
F201A	*EF-364518	FUSE BET T 250V 2.50A [550]
F201B	*EF-359225	FUSE BET T 250V 3.15A [650]
F202A	*EF-364518	FUSE BET T 250V 2.50A [550]
F202B	*EF-359225	FUSE BET T 250V 3.15A [650]
F203A	*EF-359225	FUSE BET T 250V 3.15A [550]
F203B	*EF-359086	FUSE BET T 250V 4.00A [650]
F204A	*EF-359225	FUSE BET T 250V 3.15A [550]
F204B	*EF-359086	FUSE BET T 250V 4.00A [650]

5. POWER SUPPLY P.C BOARD

Ref.No.	Part No.	Description
C201	EC-363491	C EC V CUT SME 222M 25.0DC
C203	EC-363491	C EC V CUT SME 222M 25.0DC
C251	*EC-389414J	C CE V DE7 B102K 400AC
D201	*ED-511907	D SILICON 1N4002 100/1.0A
D202	*ED-511907	D SILICON 1N4002 100/1.0A
D203	*ED-511907	D SILICON 1N4002 100/1.0A
D204	*ED-511907	D SILICON 1N4002 100/1.0A
D205	*ED-511907	D SILICON 1N4002 100/1.0A
D206	*ED-511907	D SILICON 1N4002 100/1.0A
D207	ED-388320J	D ZENER H HZS12B3L
D208	ED-388320J	D ZENER H HZS12B3L
D209	ED-388320J	D ZENER H HZS12B3L
D210	ED-400171J	D ZENER H HZS6C2L
D211	ED-400171J	D ZENER H HZS6C2L
D214	ED-307572	D SILICON H 1SS131
D215	ED-511907	D SILICON 1N4002 100/1.0A
D216	ED-511907	D SILICON 1N4002 100/1.0A
FR208	*ER-401042J	R FUSE V T05 ERD2FCV 1/4W33R0G
J6	EJ-408717J	SOCKET CFG1115-0121 RED 15P
L203	EO-338409	COIL LF FKOB160MH02 250UH
TM201	EJ-408698J	TERMINAL PUSH LQR0810-0006 8P [SP TERMINAL]
TR201	ET-348302	TR FET 2SK381 C,D F05
TR202	*ET-366581	TR 2SD1762 E,F
TR203	ET-397160J	TR 2SC3330 R,S,T,U,V
TR204	*ET-373025	TR 2SD1944 J1,J2,K

Ref.No.	Part No.	Description
TR205	ET-397160J	TR 2SC3330 R,S,T,U,V
TR206	*ET-352726	TR 2SA1392 T,U
TR207	ET-353899	TR 2SA1317 S,T,U
TR208	ET-366581	TR 2SD1762 E,F
TR209	ET-397160J	TR 2SC3330 R,S,T,U,V
TR210	ET-354365	TR DTC114YS
TR211	*ET-366581	TR 2SD1762 E,F
F1A	*EF-359007	FUSE BET T 250V 1.25A [U,B,S] [550]
F1B	*EF-601964	FUSE SEMKO T 250V 1.60A [U,B,S] [650]
F2A	*EF-359007	FUSE BET T 250V 1.25A [U] [550]
F2B	*EF-601964	FUSE SEMKO T 250V 1.60A [U] [650]
F101	*EF-601964	FUSE SEMKO T 250V 1.60A
F102	*EF-601964	FUSE SEMKO T 250V 1.60A
F103	*EF-358974	FUSE BET T 250V 630MA
F104	*EF-358974	FUSE BET T 250V 630MA

6. BALANCE VR P.C BOARD

Ref.No.	Part No.	Description
TR301	ET-354365	TR DTC114YS
TR302	ET-353899	TR 2SA1317 S,T,U
TR303	ET-353899	TR 2SA1317 S,T,U
TR304	ET-397160J	TR 2SC3330 R,S,T,U,V
TR305	ET-397160J	TR 2SC3330 R,S,T,U,V
VR301	EV-408707J	VR ROTARY RK11K1140 SP W104 [BALANCE VR]

7. MAIN VR P.C BOARD

Ref.No.	Part No.	Description
VR401	EV-408811J	VR SPL RK16EUWMZ1 B104X2 [MAIN VR]

8. PHONE/SUR P.C BOARD

Ref.No.	Part No.	Description
J501	EJ-394455J	PHONE J 3P YKB21-5006 6.3
R501	ER-397194J	R OMF V T05 FS 1W 331J
R502	ER-397194J	R OMF V T05 FS 1W 331J
SW501	ES-408695J	SW PUSH SPUL12 2-02-02N [SURROUND SW]

9. POWER SW P.C BOARD

Ref.No.	Part No.	Description
TS601	ES-408703J	SW TACT EVQ 233 05R T05 [POWER SW]

10. LED P.C BOARD

Ref.No.	Part No.	Description
D701	ED-394509J	D LED GL3HY43 ORANGE



## 11. MAIN P.C BOARD

Ref.No.	Part No.	Description
D101	ED-307572	D SILICON H 1SS131
D151	ED-307572	D SILICON H 1SS131
D301	ED-307572	D SILICON H 1SS131
D351	ED-307572	D SILICON H 1SS131
D401	ED-391003J	D ZENER H HZS4C3
D501	ED-307572	D SILICON H 1SS131
D502	ED-307572	D SILICON H 1SS131
D503	ED-307572	D SILICON H 1SS131
D504	ED-307572	D SILICON H 1SS131
D505	ED-307572	D SILICON H 1SS131
D601	ED-307572	D SILICON H 1SS131
D602	ED-408743J	D ZENER H HZS11B3L
D651	ED-307572	D SILICON H 1SS131
D652	ED-307572	D SILICON H 1SS131
D725	ED-511907	D SILICON 1N4002 100/1.0A
D726	ED-511907	D SILICON 1N4002 100/1.0A
D761	ED-307572	D SILICON H 1SS131
D762	ED-307572	D SILICON H 1SS131
D763	ED-624903	D SILICON H 1S2473
FL101	EO-408702J	COIL TUN 1 100Z-121 100.00KHZ
FL151	EO-408702J	COIL TUN 1 100Z-121 100.00KHZ
FL301	EO-408702J	COIL TUN 1 100Z-121 100.00KHZ
FL351	EO-408702J	COIL TUN 1 100Z-121 100.00KHZ
IB601	EH-408820J	COMP R RGL10T 472J
IB602	EH-408713J	COMP R RGL10T 332J
IB603	EH-408821J	COMP R RGL12T 473J
IC101	EI-310036	IC TC4066BP
IC102	EI-393323J	IC M5218AL-771
IC201	EI-389322J	IC CXA1101P
IC202	EI-394573J	IC CXA1331S
IC301	EI-393323J	IC M5218AL-771
IC551	EI-394574J	IC LA2000
IC601	EI-408700J	IC UPD75108CW-W03 MXA1DK1
IC602	EI-387938J	IC HD74LS05P
J201	EJ-394445J	SOCKET 52303-1411 BLACK 14P
L301	EO-394589J	COIL FIX 1 RCP095 822J
L302	EO-393645J	COIL FIX 1 RCP095 392J
L351	EO-394589J	COIL FIX 1 RCP095 822J
L352	EO-393645J	COIL FIX 1 RCP095 392J
L401	EO-403270J	COIL FIX 1 EL0405RA T05 101J
T401	EO-408699J	COIL OSC 1 T2134 100.0KHZ
TR101	ET-408709J	TR FET 2SK373 Y,GR T05
TR102	ET-375986	TR DTC124TS
TR103	ET-354364	TR DTC143TS
TR104	ET-354364	TR DTC143TS
TR105	ET-354364	TR DTC143TS
TR106	ET-354364	TR DTC143TS
TR107	ET-370310	TR DTC144TS
TR108	ET-370310	TR DTC144TS
TR151	ET-408709J	TR FET 2SK373 Y,GR T05
TR152	ET-375986	TR DTC124TS
TR153	ET-354364	TR DTC143TS
TR154	ET-354364	TR DTC143TS
TR155	ET-354364	TR DTC143TS
TR156	ET-354364	TR DTC143TS
TR157	ET-370310	TR DTC144TS
TR158	ET-370310	TR DTC144TS
TR181	ET-369248	TR DTA114YS
TR182	ET-370310	TR DTC144TS
TR183	ET-370310	TR DTC144TS
TR184	ET-369248	TR DTA114YS
TR185	ET-369248	TR DTA114YS
TR186	ET-369248	TR DTC144YS
TR187	ET-354414	TR DTC144ES
TR188	ET-354414	TR DTC144ES
TR201	ET-397160J	TR 2SC3330 R,S,T,U,V
TR202	ET-397160J	TR 2SC3330 R,S,T,U,V
TR251	ET-397160J	TR 2SC3330 R,S,T,U,V
TR252	ET-397160J	TR 2SC3330 R,S,T,U,V
TR281	ET-354414	TR DTC144ES
TR301	ET-397160J	TR 2SC3330 R,S,T,U,V
TR302	ET-354364	TR DTC143TS
TR303	ET-354364	TR DTC143TS
TR304	ET-354364	TR DTC143TS
TR305	ET-408777J	TR FET 2SJ40 D,E T05

Ref.No.	Part No.	Description
TR351	ET-397160J	TR 2SC3330 R,S,T,U,V
TR352	ET-354364	TR DTC143TS
TR353	ET-354364	TR DTC143TS
TR354	ET-354364	TR DTC143TS
TR355	ET-408777J	TR FET 2SJ40 D,E T05
TR381	ET-369248	TR DTA114YS
TR401	ET-354414	TR DTC144ES
TR402	ET-354414	TR DTC144ES
TR403	ET-397160J	TR 2SC3330 R,S,T,U,V
TR404	ET-373391	TR DTC143ZS
TR405	ET-373025	TR 2SD1944 J1,J2,K
TR406	ET-397160J	TR 2SC3330 R,S,T,U,V
TR407	ET-397160J	TR 2SC3330 R,S,T,U,V
TR408	ET-354364	TR DTC143TS
TR409	ET-400741J	TR 2SC3708 T T05
TR410	ET-400741J	TR 2SC3708 T T05
TR501	ET-397160J	TR 2SC3330 R,S,T,U,V
TR502	ET-397160J	TR 2SC3330 R,S,T,U,V
TR503	ET-397160J	TR 2SC3330 R,S,T,U,V
TR504	ET-397160J	TR 2SC3330 R,S,T,U,V
TR505	ET-397160J	TR 2SC3330 R,S,T,U,V
TR506	ET-397160J	TR 2SC3330 R,S,T,U,V
TR601	ET-373485	TR DTC123JS
TR602	ET-354365	TR DTC114YS
TR603	ET-373382	TR DTA143ZS
TR606	ET-354365	TR DTC114YS
TR607	ET-354365	TR DTC114YS
TR608	ET-361736	TR 2SC3576
TR609	ET-361736	TR 2SC3576
TR610	ET-373485	TR DTC123JS
TR611	ET-373391	TR DTC143ZS
TR612	ET-361736	TR 2SC3576
TR613	ET-361736	TR 2SC3576
TR614	ET-373485	TR DTC123JS
TR615	ET-373391	TR DTC143ZS
TR616	ET-373391	TR DTC143ZS
TR617	ET-408772J	TR 2SA1318 S,T,U T05
TR618	ET-408772J	TR 2SA1318 S,T,U T05
TR653	ET-353899	TR 2SA1317 S,T,U
TR654	ET-353899	TR 2SA1317 S,T,U
TR655	ET-373382	TR DTA143ZS
TR656	ET-396072J	TR 2SD2159 V,W
TR657	ET-396072J	TR 2SD2159 V,W
TR658	ET-396072J	TR 2SD2159 V,W
TR659	ET-397160J	TR 2SC3330 R,S,T,U,V
TR660	ET-397160J	TR 2SC3330 R,S,T,U,V
TR761	ET-373985	TR DTA144TS
TR762	ET-354414	TR DTC144ES
TR763	ET-354414	TR DTC144ES
TR764	ET-397160J	TR 2SC3330 R,S,T,U,V
TR765	ET-354414	TR DTC144ES
VR101	EV-404323J	R S-FIX H V8K4-11 (1S) 0.10W332
VR102	EV-404323J	R S-FIX H V8K4-11 (1S) 0.10W332
VR151	EV-404323J	R S-FIX H V8K4-11 (1S) 0.10W332
VR152	EV-404323J	R S-FIX H V8K4-11 (1S) 0.10W332
VR301	EV-403967J	R S-FIX V T05EVNDCAA03 0.1W332
VR351	EV-403967J	R S-FIX V T05EVNDCAA03 0.1W332
VR402	EV-341249	R S-FIX V TM8KH1-1S 0.50W303
VR403	EV-341249	R S-FIX V TM8KH1-1S 0.50W303
VR651	EV-394561J	R S-FIX H V8K4-11 (1S) 0.10W102
VR652	EV-394561J	R S-FIX H V8K4-11 (1S) 0.10W102
VR653	EV-367524	R S-FIX H V8K4-11 (1S) 0.10W501
VR654	EV-367524	R S-FIX H V8K4-11 (1S) 0.10W501
X601	EI-373957J1	OSC CE CST4.19MGW 4.194MHZ

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## 12. OPERATION P.C BOARD

Ref.No.	Part No.	Description
D801	ED-394509J	D LED GL3HY43 ORANGE
D802	ED-394509J	D LED GL3HY43 ORANGE
D803	ED-394509J	D LED GL3HY43 ORANGE
D804	ED-394509J	D LED GL3HY43 ORANGE
D805	ED-394509J	D LED GL3HY43 ORANGE
D806	ED-394509J	D LED GL3HY43 ORANGE
D807	ED-394509J	D LED GL3HY43 ORANGE
D808	ED-394509J	D LED GL3HY43 ORANGE
D809	ED-394724J	D LED GL3PR43 RED
SW801A	ES-408706J	SW SLIDE SSSS91 L=2 1-01-02N [550]
SW801B	ES-408708J	SW SLIDE SSSS91 L=2 1-01-03 [650]
TS801	ES-408703J	SW TACT EVQ 233 05R T05
TS802	ES-408703J	SW TACT EVQ 233 05R T05
TS803	ES-408703J	SW TACT EVQ 233 05R T05
TS804	ES-408703J	SW TACT EVQ 233 05R T05
TS805	ES-408703J	SW TACT EVQ 233 05R T05
TS806	ES-408703J	SW TACT EVQ 233 05R T05
TS807	ES-408703J	SW TACT EVQ 233 05R T05
TS808	ES-408703J	SW TACT EVQ 233 05R T05
TS809	ES-408703J	SW TACT EVQ 233 05R T05
TS810	ES-408703J	SW TACT EVQ 233 05R T05
TS811	ES-408703J	SW TACT EVQ 233 05R T05

## 13. FINAL ASSEMBLY

Ref.No.	Part No.	Description
1A	SP-407847M	PANEL FRONT AX-550 (SG) [550]
1B	SP-407848M	PANEL FRONT AX-650 (SG) [650]
2	SE-394092M	REFLECTOR (SG)
3	SZ-407871M	RING FOOT (A) (SG)
4	SA-394136M	CUSHION FOOT (SG)
5	SZ-408739J	PUSH CATCH 4U44
6	SE-407868M	LENS OP (L) (SG)
7	SE-407869M	LENS OP (R) (SG)
8	SB-407860M	BUTTON OP (SG)
9	SB-407861M	BUTTON TAPE (SG)
10	SK-407866M	KNOB SLIDE (SG)
11	ZS-331182	BT BID30X08STL BNI
12	SB-407862M	BUTTON POWER (SG)
13	SB-407863M	BUTTON SURROUND (SG)
14	ZS-407886M	BT PAN30X08STL BZN C100 (SG)
15	SP-407849M	LID PANEL (L) (SG)
16	SP-407850M	LID PANEL (R) (SG)
17	SE-407870M	WINDOW LID (SG)
18	ZG-394158M	SP PLATE CASSETTE HOLDER (SG)
19	MZ-408740J	DUMPER 2G50-C
20	ZS-357727	ST PAN20X05STL CMT
21	BB-408737M	MECHA GAK9301 [TAPE 1]
22	BB-408736M	MECHA GAK9601 [TAPE 2]
23	ZG-407841J	SP TORSION EJECT (L)
24	ZG-407842J	SP TORSION EJECT (R)
25	SA-407840M	CUSHION FOOT REAR (SG)
26	ZS-376591	BT BID30X06STL BNI
27	ZS-725336J	BT BID30X16STL BNI
28A	*BT-408727M	TRANS POW C1029 U [550]
28B	*BT-408728M	TRANS POW C1029 EV [550]
28C	*BT-408729M	TRANS POW C1029 BS [550]
28D	*BT-408730M	TRANS POW C1030 U [650]
28E	*BT-408731M	TRANS POW C1030 EV [650]
28F	*BT-408732M	TRANS POW C1030 BS [650]
29	ZS-346742	ST BID40X08STL CMT CUP
30A	SP-407856M	PANEL REAR AX-550 (U) (SG)
30B	SP-407855M	PANEL REAR AX-550 (E) (SG)
30C	SP-407857M	PANEL REAR AX-550 (V) (SG)
30D	SP-407858M	PANEL REAR AX-550 (B,S) (SG)
30E	SP-407852M	PANEL REAR AX-650 (U) (SG)
30F	SP-407851M	PANEL REAR AX-650 (E) (SG)
30G	SP-407853M	PANEL REAR AX-650 (V) (SG)
30H	SP-407854M	PANEL REAR AX-650 (B,S) (SG)
31	ZS-366385	T2BR30X08STL BNI PROJECTION
32A	*EW-408790M	AC CORD200 SZ4W H03VVH2F B120 U
32B	*EW-404002M	AC CORD 200 SE-1 WITH TUBE E
32C	*EW-404001M	AC CORD 200 VCTFK WITH TUBE B
32D	*EW-404003M	AC CORD 200 SA-2 WITH TUBE S
33	*EZ-371605	BUSH CORD 2271
34	*ES-349070	SW SELECTOR YKS11-0002 02-4
35	SE-407867M	LENS VR (SG)
36	SK-407864M	KNOB VR (SG)
37	SK-407865M	KNOB BALANCE (SG)
38	SP-407859M	COVER UPPER (SG)

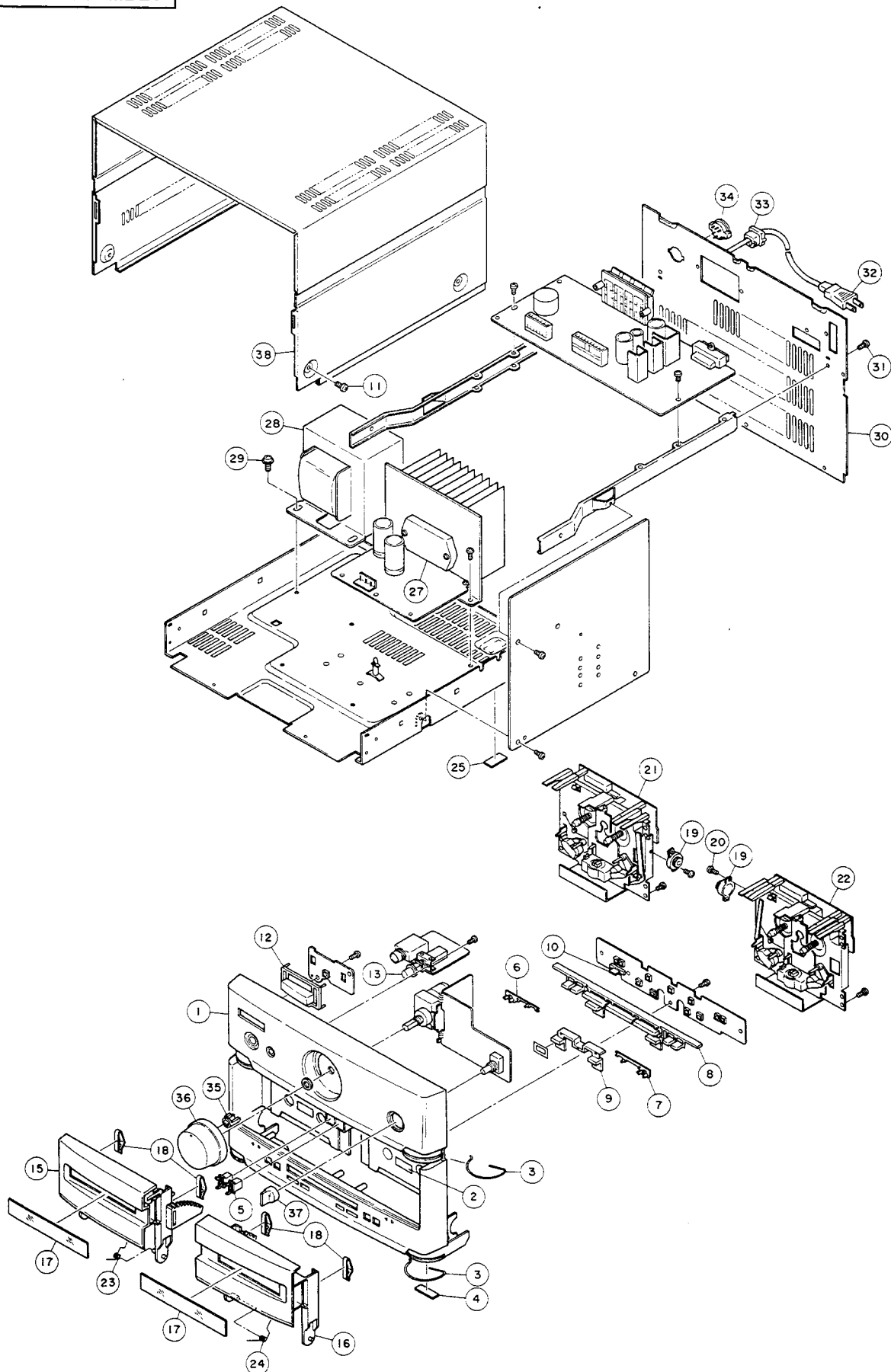
### NOTE:

Parts will not be supplied if they are not listed in the parts list, even if they appear on the assembling illustrations with reference No.

## 14. ACCESSORY

Ref.No.	Part No.	Description
1	AX-408738M	REMOCON RC-S650

# **FINAL ASSEMBLY**



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BAC1029T050B	3-1B	ED511907	5-D202	ES408695J	8-SW501	ET373382	11-TR655
BAC1029T050C	3-1C	ED511907	5-D203	ES408703J	9-TS601	ET373391	11-TR404
BAC1029T050D	3-1D	ED511907	5-D204	ES408703J	12-TS801	ET373391	11-TR611
BAC1029T050E	3-1E	ED511907	5-D205	ES408703J	12-TS802	ET373391	11-TR615
BAC1029T050F	3-1F	ED511907	5-D206	ES408703J	12-TS803	ET373391	11-TR616
BAC1029T050G	3-1G	ED511907	5-D215	ES408703J	12-TS804	ET373485	11-TR601
BAC1029T050H	3-1H	ED511907	5-D216	ES408703J	12-TS805	ET373485	11-TR610
BAC1029T060A	3-2A	ED511907	11-D725	ES408703J	12-TS806	ET373485	11-TR614
BAC1029T060B	3-2B	ED511907	11-D726	ES408703J	12-TS807	ET373985	11-TR761
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BB408737M	13-21	EF358974	5-F103	ES408703J	12-TS809	ET375986	11-TR102
BF733191J	2-103	EF358974	5-F104	ES408703J	12-TS810	ET375986	11-TR152
BF733192J	2-104	EF359007	5-F1A	ES408703J	12-TS811	ET396072J	11-TR656
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ED388320J	5-D209	EO394589J	11-L301	ET354414	11-TR765	EV367524	11-VR654
ED391003J	11-D401	EO394589J	11-L351	ET361736	11-TR608	EV394561J	11-VR651
ED394509J	10-D701	EO403270J	11-L401	ET361736	11-TR609	EV394561J	11-VR652
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ED394509J	12-D802	EO408702J	11-FL101	ET361736	11-TR613	EV403967J	11-VR351
ED394509J	12-D803	EO408702J	11-FL151	ET366581	5-TR202	EV404323J	11-VR101
ED394509J	12-D804	EO408702J	11-FL301	ET366581	5-TR208	EV404323J	11-VR102
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ED394509J	12-D808	ER341091	2-73	ET369248	11-TR381	EV408811J	7-VR401
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ED394724J	12-D809	ER397193J	4-R10	ET370310	11-TR108	EW404002M	13-32B
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ED400171J	5-D211	ER397193J	4-R60	ET370310	11-TR158	EW408790M	13-32A
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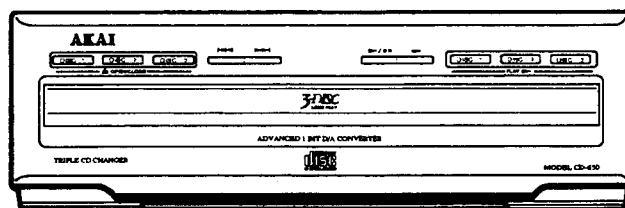
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## ABBREVIATIONS (AMPLIFIER)

ABBREVIATION	EXPLANATION	ABBREVIATION	EXPLANATION
A	Analog	MM	Moving Magnet
AC	Alternating Current	PCB	Printed Circuit Board
AMP	AMPlifier	R	Right
CD	Compact Disc	REG	REGulator
COM	COMmon	REC	RECOrd
D	Digital	TR	TRAnsistor
D/A	Digital to Analog	SW	SWitch
DAC	Digital to Analog Converter	V.AMP	Voltage AMPlifier
DAT	Digital Audio Tape recorder	V.DISC	Video DISC
DC	Direct Current	VR	Variable Resistance
GND	GrouND	VTR	Video Tape Recorder
L	Left		
LED	Light Emitting Diode		

## ABBREVIATIONS (CASSETTE)

ABBREVIATION	EXPLANATION	ABBREVIATION	EXPLANATION
AC	Alternating Current	MIN	MINute
A/D	Analog/Digital	MML	Maximum Modulation Level
AF	Auto Fader	MOL	Maximum Output Level
AMP	AMPlifier	MPX	Multi PleX
AR	Anti Recording	NC	Not Connected (No Connection)
AT BIAS	Auto Turning BIAS	NFB	Negative Feed Back
ATT	ATTenuator	NORM	NORMAl
BAL	BALance	NR	Noise Reduction
BEF	Band Elimination Filter	OSC	OSCillator (OSCillation)
BSS	Blank Search System	P	Pulse
CAP M	CAPstan Motor	PB	Play Back
CH	CHannel	QMSS	Quick Memory Search System
COMP	COMParator	QR	Quick Reverse
CONT	CONTinuanance	R CH	Right CHannel
CRLP	Computer Recording Level Processing	REC	RECOrd (RECOding)
CS	Chip Select	REV	REVerse
D/A	Digital/Analog	ROT	ROTation
DC	Direct Current	REW	REWind
DET	DETEctor	SEC	SECOnd
DISCRI	DISCRIminator	SELE	SELEctor
DUB	DUBbing	SENS	SENSitivity
EQ	EQualizer	SEPP	Single Ended Push Pull
FF (or F.FWD)	Fast Foward	SIG	SIGnal
FLD	FLuorescent Display	SPECT	SPECTrum
FREQ	FREQuency	STD	STANdard
FWD	ForWarD	SW	SWitch
GND	GrouND	SYSCON	SYSTEM CONtrol
H	High	TP	Test Point
HPF	High Pass Filter	TRIG	TRIGa
IND	INDicator	VCA	Voltage Control Attenuator
IPLS	Instant Program Location System	VOL	VOLUME
L	Low	VOLT	VOLTage
L CH	Left CHannel	VR	Variable Resistor
LED	Light Emitting Diode	X'TAL	cysTAL
MEMO	MEMOry	X1	Normal speed
MICOM	MicroCOMputer	X2	Dubble speed



## MULTI COMPACT DISC PLAYER

**MODEL CD-650**

## SPECIFICATIONS

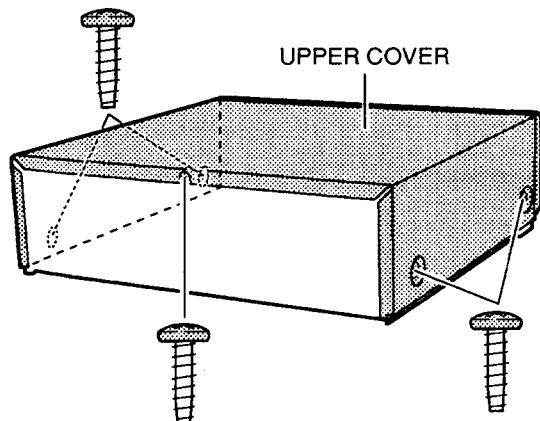
Type .....	3 discs auto changer
Pick up system .....	3 beam laser pick-up
Sampling frequency .....	44.1kHz
Error correction system .....	Cross interleave reed solomon
Number of channels .....	2 channel stereo
Frequency response .....	20 to 20,000Hz $\pm 1$ dB
S/N ratio .....	95dB (A-weight)
Wow & flutter .....	Less than measurable limits
Total harmonic distortion .....	0.01% (at 1kHz)
Channel separation .....	85dB (at 1kHz)
Dynamic range .....	95dB
Dimensions .....	270(W) x 88(H) x 324(D)mm
Weight .....	2.5kg
Power requirement .....	Supplied from AX-550/650
Power consumption .....	10W

\* For improvement purposes, specifications and design are subject to change without notice.

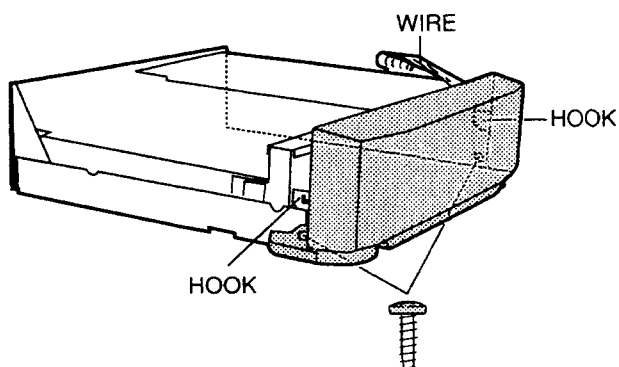
# I.DISASSEMBLY

In case of trouble, etc., necessitating dismantling, please dismantle in the order shown in the illustrations.  
Reassemble in the reverse order.

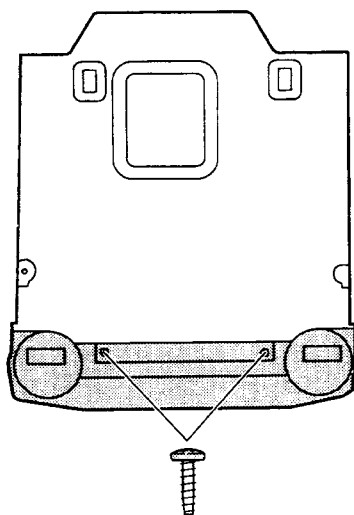
## 1. Removal of the UPPER COVER



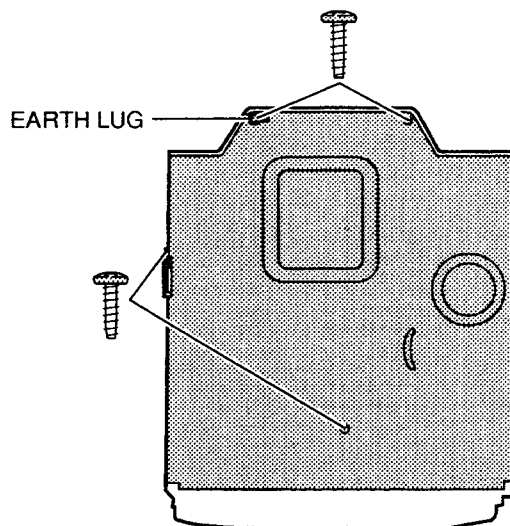
3



## 2. Removal of the FRONT PANEL



## 4. Removal of the BOTTOM COVER





## II. PRINCIPAL PARTS LOCATION

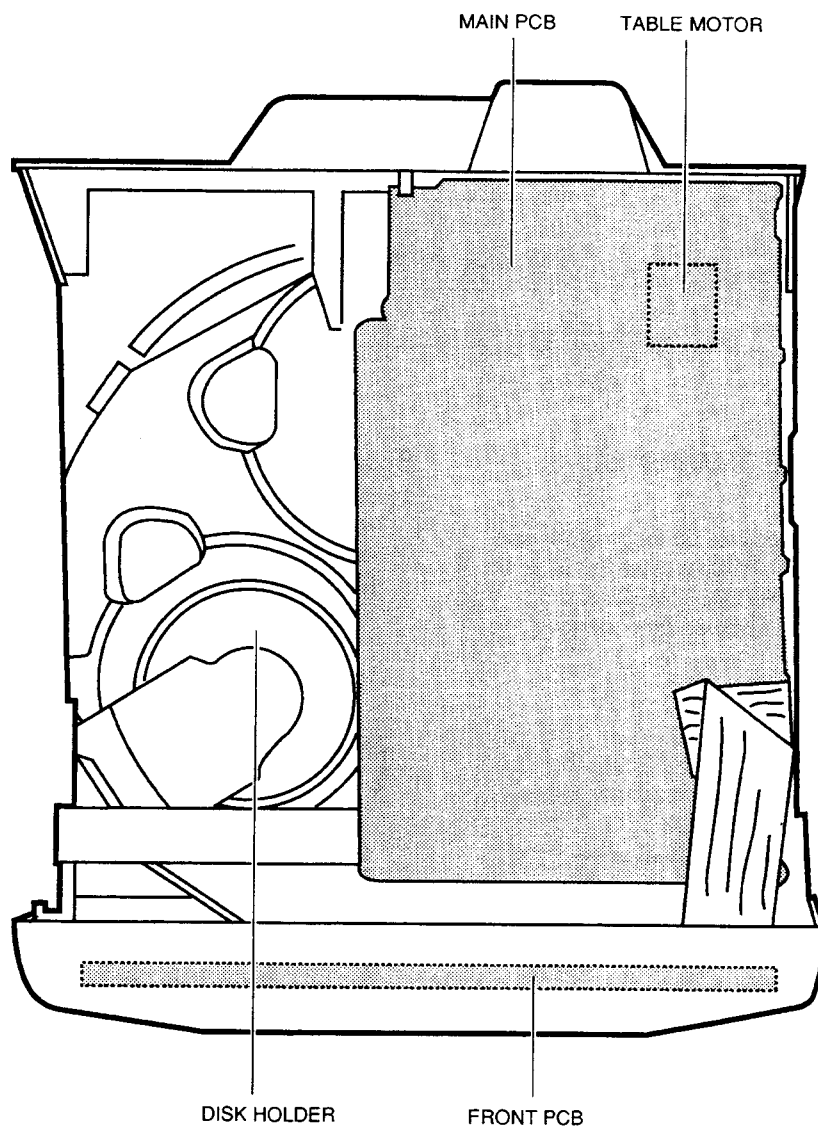


Fig.2-1 Top view

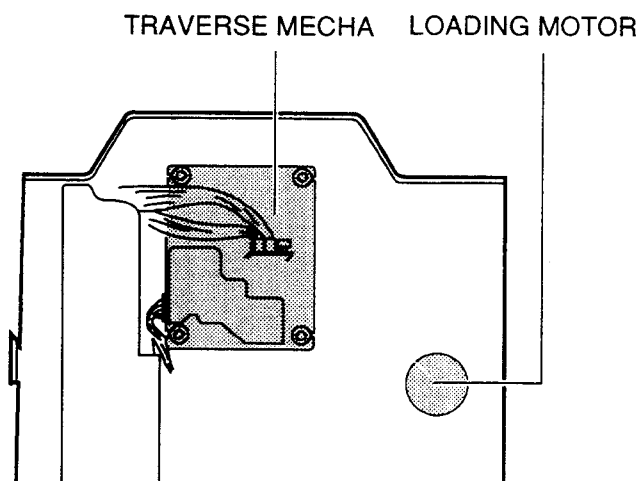
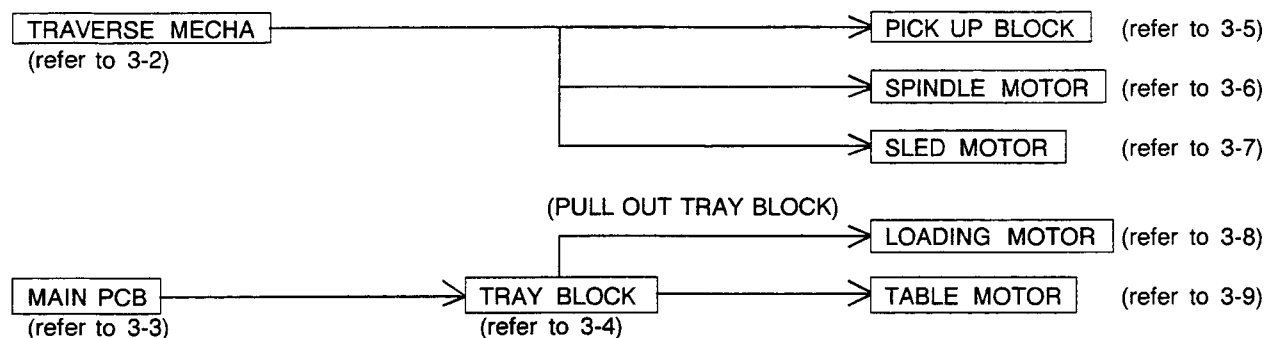


Fig.2-2 Bottom view

# III.REPLACEMENT OF THE PRINCIPAL COMPONENTS

## 3-1.DISMANTLING PROCEDURE OF THE COMPONENTS

When replacement of the mechanical parts is necessary, replace them using the following procedure.



## 3-2.REMOVAL OF THE TRAVERSE MECHA.

- 1) Disconnect the three connectors carefully (two connectors are on the PICK UP PCB and the other is on the MOTOR PCB of the TRAVERSE MECHA.).
- 2) Remove the four retaining screws, then remove the PICK UP UNIT.

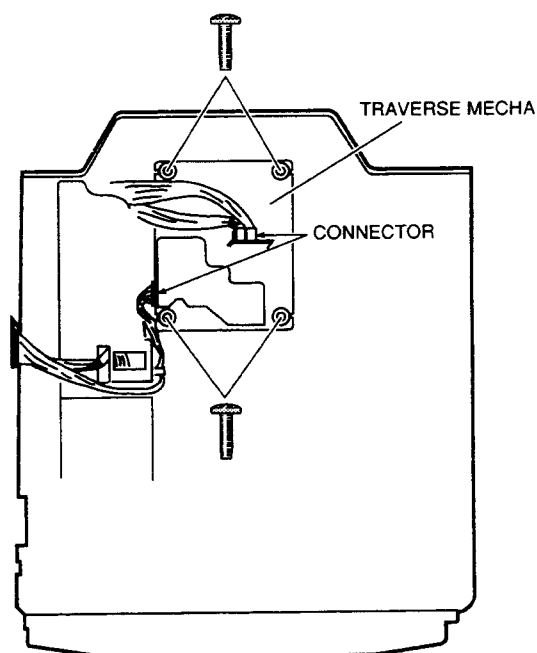


Fig.3-1

## 3-3.REMOVAL OF THE MAIN PCB

- 1) Disconnect the P4, P5 and P6 connectors on the MAIN PCB.
- 2) Remove the four retaining screws of the MAIN PCB, then remove the MAIN PCB.

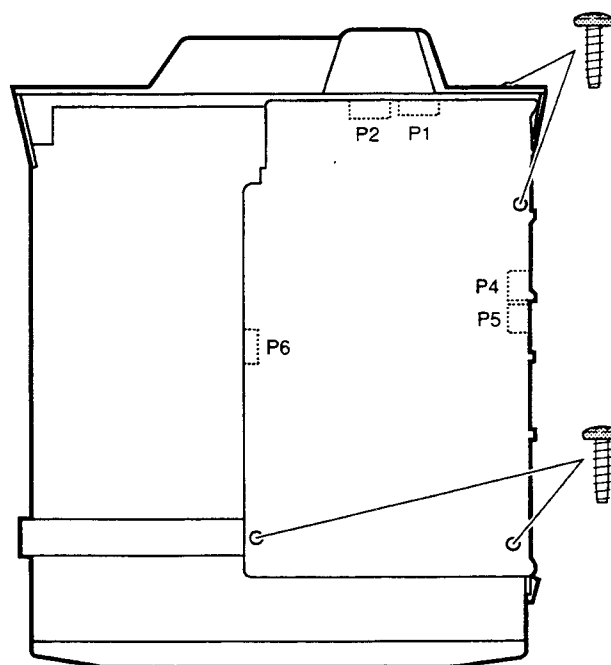


Fig.3-2

### 3-4.REMOVAL OF THE TRAY BLOCK

- 1) Remove the MAIN PCB.
- 2) Slide the GEAR HOLDER RETAINING SCREW in the direction of the arrow and pull out the TRAY BLOCK slowly.
- 3) Remove the MAIN PCB HOLDER RETAINING SCREWS then remove the MAIN PCB HOLDER and the BRACKETS on both side.
- 4) Remove the TRAY BLOCK.

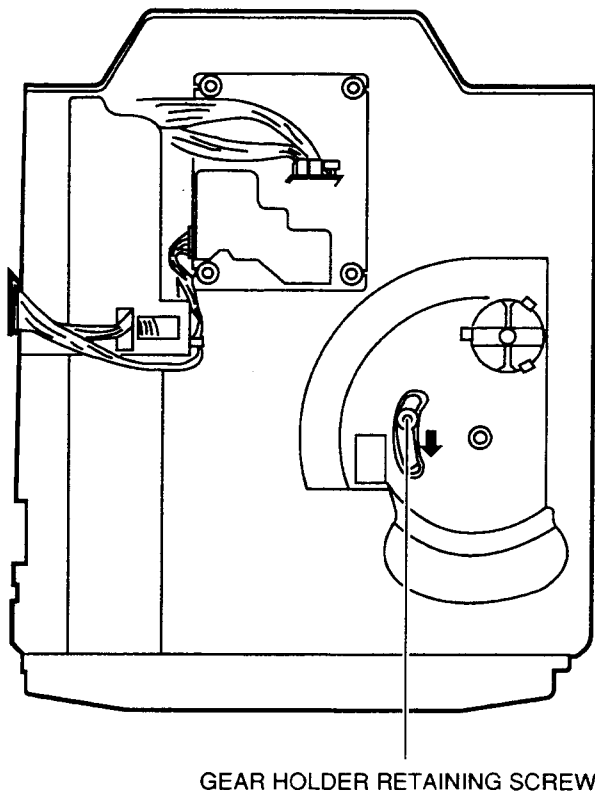


Fig.3-3

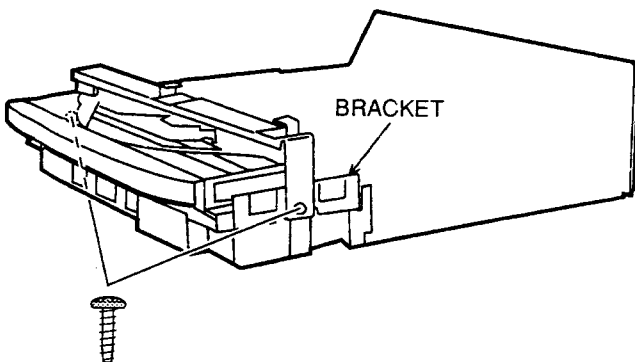


Fig.3-4

### 3-5.REPLACEMENT OF THE PICK UP BLOCK

- 1) Remove the TRAVERSE MECHA.
- 2) Push the Ⓐ stopper in the right direction and pull the SLIDE SHAFT in the forward direction to remove the PICK UP BLOCK, then replace the PICK UP BLOCK.
- 3) Reassemble in the reverse order.

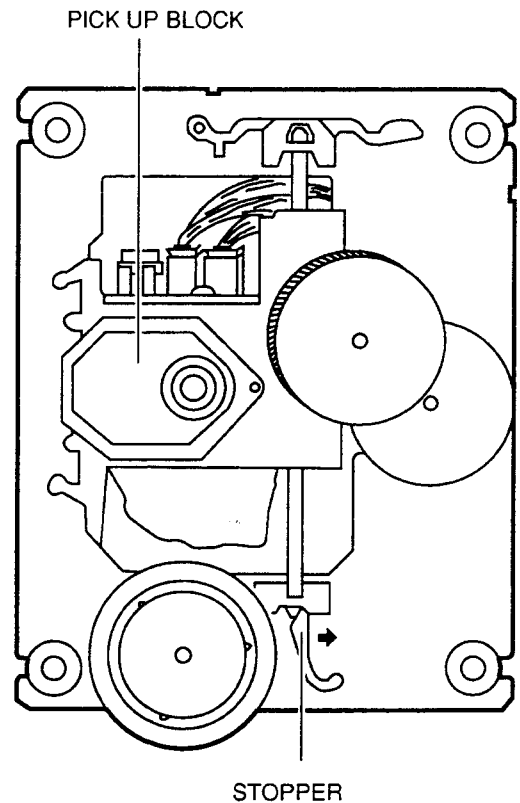


Fig.3-5

### 3-6.REPLACEMENT OF THE SPINDLE MOTOR

Replacement of the SPINDLE MOTOR itself is not recommended, because the adjustment of the TURN TABLE height is quite critical and necessitating the use of a special jig.

### 3-7.REPLACEMENT OF THE SLED MOTOR

- 1) Remove the TRAVERSE MECHA.
- 2) Remove the MOTOR PCB.
- 3) Remove the SLED MOTOR RETAINING ⑧ SCREWS, then replace the SLED MOTOR.
- 4) Reassemble in the reverse order.

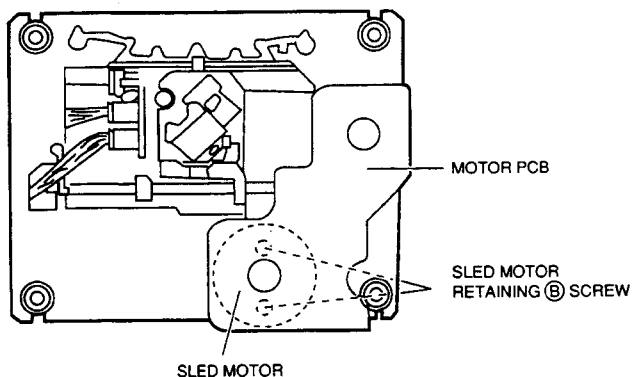


Fig.3-6

### 3-8.REPLACEMENT OF THE LOADING MOTOR

- 1) Push the GEAR HOLDER RETAINING SCREW in the direction of the arrow, then pull out the TRAY BLOCK.
- 2) Remove the LOADING BELT and the LOADING MOTOR RETAINING SCREWS.
- 3) Unsolder the lead wires of the LOADING MOTOR with a soldering iron.
- 4) While opening the LOADING MOTOR'S THREE RETAINING HOOKS, remove and replace the LOADING MOTOR.
- 5) Reassemble in the reverse order.

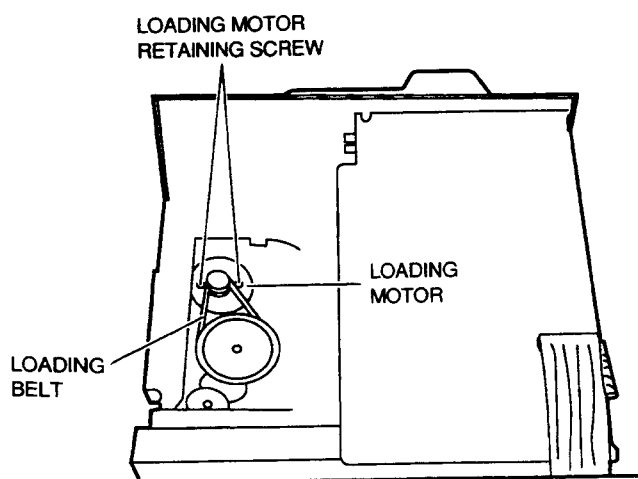


Fig.3-7

### 3-9.REPLACEMENT OF THE TABLE MOTOR

- 1) Remove the MAIN PCB.
- 2) Remove the TRAY BLOCK.
- 3) Remove the DISC HOLDER RETAINING SCREW then remove DISC HOLDER.
- 4) Remove the GEAR COVER then remove the TABLE GEAR (B) and GEAR WORM WHEEL TABLE.
- 5) Unsolder the lead wires of the TABLE MOTOR.
- 6) Remove the TABLE MOTOR while opening the TABLE MOTOR RETAINING HOOK, then replace the TABLE MOTOR.
- 7) Reassemble in the reverse order.

NOTE: 1) When reassembling, make sure that the TABLE GEAR (A)'s hole is aligned with the reference hole on the LOADING TRAY.  
 2) When installing the DISC HOLDER on the LOADING TRAY, make sure to place the DISC HOLDER so that the label "3" is facing upward (label "2" faces right and label "1" faces left accordingly).

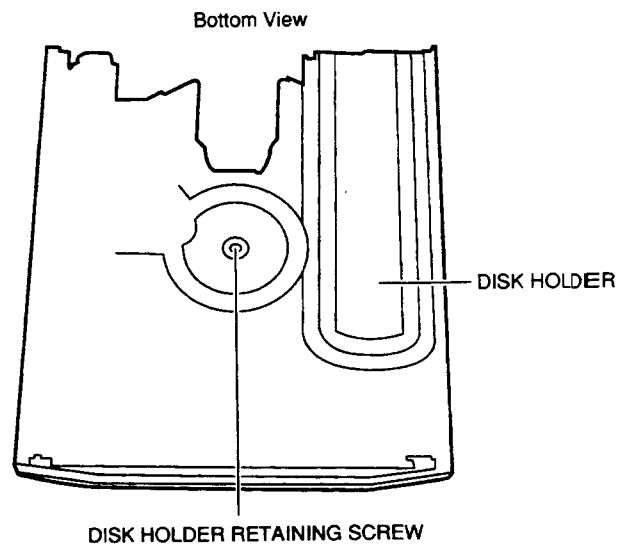


Fig.3-8

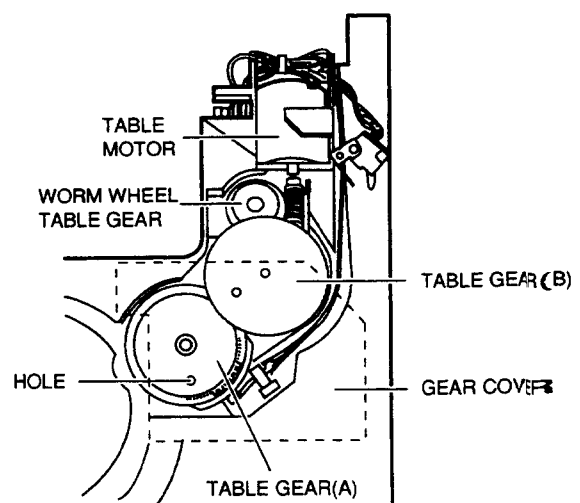


Fig.3-9

# IV. ELECTRICAL ADJUSTMENT

Before making adjustments 1 - 5, load a test disc as follows.

After first setting the unit to the test mode 1, press the ►/▲ button to open the disc tray and place a SONY TYPE 3 test disc on the DISC 1 holder. Press the ►/▲ button again to close the tray. Adjustments can now be made.

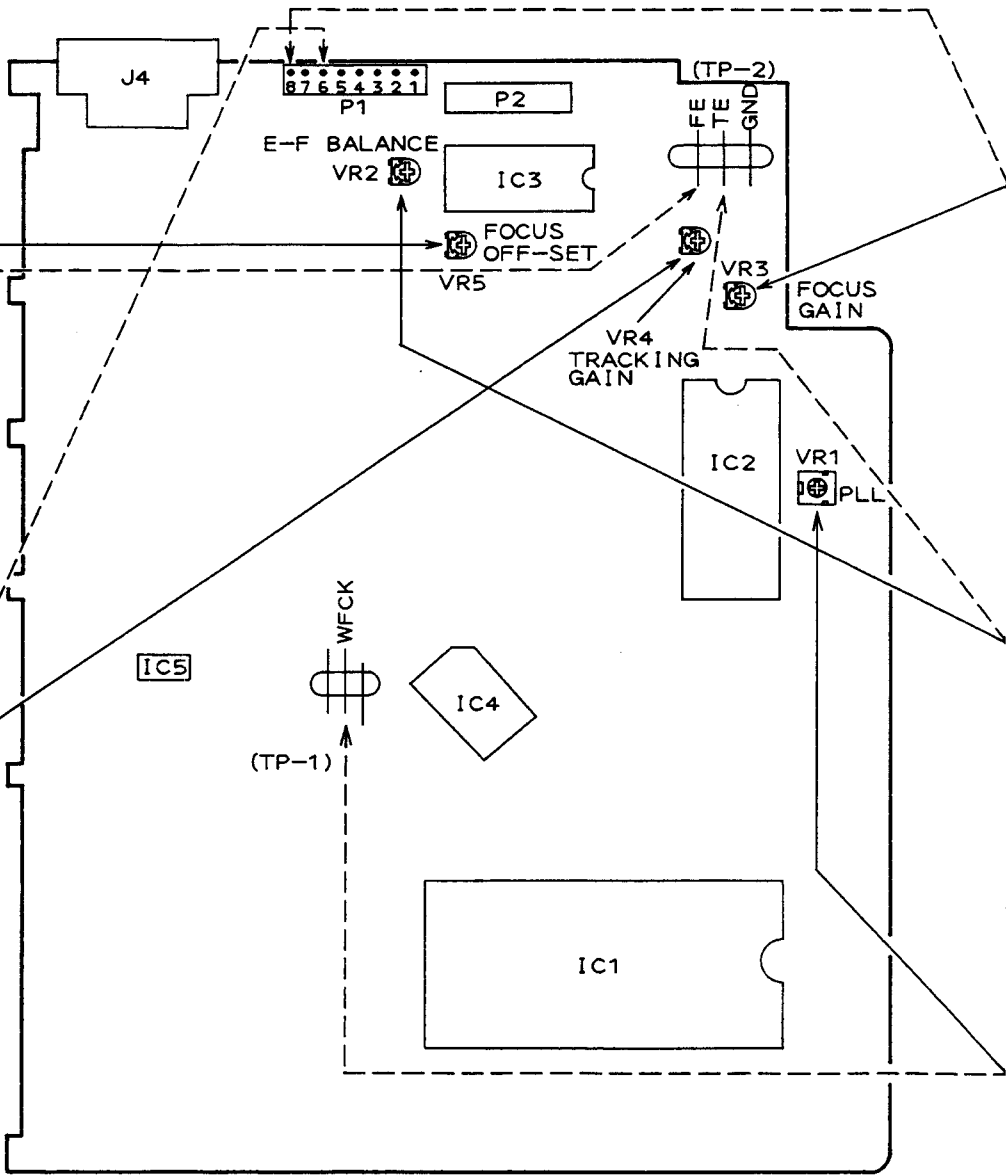
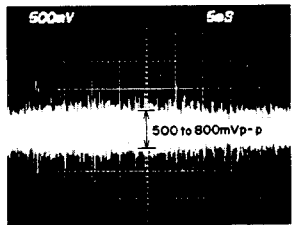
STEP	ADJUSTMENT
1.	TEST DISC
2.	MODE or TEST mode
3.	TEST POINT and ADJUSTMENT parts.
4.	REMARK (●), RESULT (*)

Test point

ADJ.part

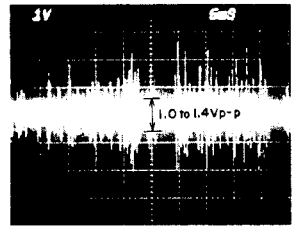
5 FOCUS OFF-SET
1. Test disc SONY TYPE 3 (AT-711881)
2. Test mode 2 and 1
3. FE (TP-2) / VR 5
4. ●Connect a digital DC voltmeter to the TP 2 (FE) and check the voltage A in the test mode 2, then press STOP button and adjust the voltage B so that the reading on the digital DC voltmeter is the same as voltage A. *A=B

4 TRACKING SERVO GAIN
1. Test disc SONY TYPE 3 (AT-711881)
2. Test mode 5
3. P1 ⑥ pin / VR 4
4. ●Connect an oscilloscope to the P1 connector ⑥ pin. *500 to 800mVp-p

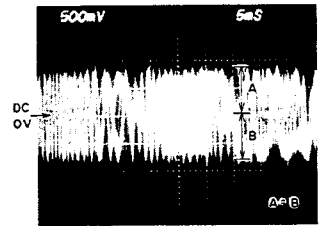


↓  
FRONT  
MAIN PCB

3 FOCUS SERVO GAIN
1. Test disc SONY TYPE 3 (AT-711881)
2. Test mode 5
3. P1 ⑧ pin / VR 3
4. ●Connect an oscilloscope to the P1 connector ⑧ pin *1.0 to 1.4Vp-p



2 E-F BALANCE
1. Test disc SONY TYPE 3 (AT-711881)
2. Test mode 3
3. TE (TP 2) / VR 2
4. ●Connect an oscilloscope to the TP 2 (TE) *A=B



1 VCO
1. —
2. Test mode 1
3. WECK (TP-1) / VR 1
4. ●Connect a frequency counter to the TP 1 (WECK). *7,350 ±10Hz

TEST MODE	HOW TO SET EACH MODE	FUNCTION	LED 1	LED 2	LED 3	MUSIC CALENDAR
1	While pressing the ■ and ►/▲ buttons, insert the power cord.	●Indicates that unit is set into the TEST mode.	ON	OFF	OFF	1
2	Press the ▲ OPEN/CLOSE DISC 1 button	●FOCUS SERVO is on.	OFF	ON	OFF	2
3	Press the ▲ OPEN/CLOSE DISC 2 button	●CLV-S SERVO is on.	ON	ON	OFF	3
4	Press the ▲ OPEN/CLOSE DISC 3 button	●TRACKING SERVO is on.	OFF	OFF	ON	4
5	Press the PLAY ► DISC 1 button	●CLV-A and SLED SERVO are on.	ON	OFF	ON	5
6	Press the PLAY ► DISC 2 button	●ANTI SHOCK is on	OFF	ON	ON	6

- The disc tray can be opened or closed by pressing the ►/■ button (during any mode). After opening the tray, closing it will move the pick up to the inward position and return the unit to the TEST MODE 1.
- Pressing the ■ button will return the unit to the TEST MODE 1 regardless of the test mode presently engaged. However, the pick up will not be moved.
- Test modes can be selected directly.

V. PARTS LIST

ATTENTION

1. When placing an order for parts, be sure to list Part No., Model No. and the description of eachpart. Otherwise, the non-delivery of the part or the delivery of a wrong part may result.
2. Please make sure that Part No. is correct when ordering. If not, a part different from the one you ordered may be delivered.
3. Since the parts shown in Parts List of Preliminary Service Manual may have been the subject of changes, please use this Parts List for all future reference.

HOW TO USE THIS PARTS LIST

1. This Parts List lists those parts which are considered necessary for repairs. Other common parts, such as resistors and capacitors, are listed in the "Common List for Service Parts" from which these parts should be selected and stocked.
2. The Recommended Spare Parts List shows those parts in the Parts List which are considered particularly important for service.
3. Parts not shown in the Parts List and "Common List for Service Parts" will not in principle be supplied.
4. How to read the Parts List.

a) Mechanism Block

2. HEAD BASE BLOCK

Ref. No.	Part No.	Description
1	BH-T2023A320A	HEAD BASE BLOCK
2	HP-H2206A010A	HEAD R/P PR4-8FU C
3	ZS-477876	PAN20X03STL CMT
4	ZS-536488	BID20X08STL CMT
5	ZG-402895	SP CS ANGLE ADJUST

SP (Service Parts) Classification

This number corresponds with the individual parts index number in that figure.

b) PC Board

6. MAIN PC BOARD

Ref. No.	Part No.	Description
IC1	EI-324536	IC HD14049BP
IC2	EI-336801	IC MB8841-564M
C1A	EC-338399	C MMY V 223M 250AC [U,E,B,S]
C1B	EC-350949	C MMY V 223M 250DC [J]
C1C	EC-338397	C MMY V 223M 125AC [C,A]
X1	EI-318384	OSC X'TAL NC-18C

Symbols for primary destination

[A] : AAL (U.S.A) [S] : SAA (Australia)  
[B] : BEAB (England) [U] : U/T (Universal Area)  
[C] : CSA (Canada)  
[E] : CEE (Europe) [V] : VDE (Germany)  
[J] : JPN (Japan) [Y] : Custom Version

SP (Service Parts) Classification

These reference symbols correspond with component symbols in the Schematic Diagrams.

The available PC Board Blocks are listed separately.

5. When Part No. is known, Parts Index at end of Parts List can be used to locate where that part is shown in Parts List by its Reference No. listed at right of Part No.

WARNING

⚠ (\*) INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURE'S RECOMMENDED PARTS.

AVERTISSEMENT

⚠ (\*) IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT.

1. RECOMMENDED SPARE PARTS

We suggest you to stock the following Recommended Spare Part items listed below since they can cover most of the routine service.

Ref.No.	Part No.	Description
1	*BB-408757N	MECHA TRAVERSE KSM-2101ABM
2	BM-733203J	MOTOR GEAR ASSY (MB)
3	BM-374198	MOTOR RF-370CA-15370
4	BM-408752M	MOTOR RF-500TB-14415
5	*BO-394728J	PICK UP KSS-210A
6	ED-408651J	D LED SEL2913K ORANGE
7	ED-307572	D SILICON H 1SS131
8	*ED-511907	D SILICON 1N4002 100/1.0A
9	ED-408721J	D ZENER H HZS2B3
10	ED-408720J	D ZENER H HZS3C1
11	ED-408719J	D ZENER H HZS4C2
12	ED-403743J	D ZENER H HZS6B3
13	*ED-400171J	D ZENER H HZS6C2L
14	EH-408654J	COMP R RGLE10T 223J
15	EH-404307J	COMP R RGLE13X 223J
16	EH-408656J	COMP R RGLE6X 472J
17	EI-330352	IC BA6109
18	EI-389264J	IC BA6209N
19	EI-390112J	IC CXA1081S
20	EI-390120J	IC CXA1082BS
21	EI-403497J	IC CXD1167Q
22	EI-387938J	IC HD74LS05P
23	EI-408657J1	IC M38002M4-126SP MXA1CD2
24	EI-393325J	IC M5218AP
25	EI-213390	IC NJM4558D
26	EI-408658J	IC PCM67U
27	EI-390149J	OSC CE CST4.23MGW 4.230MHZ
28	EI-381139J	OSC X'TAL HC-49/U 16934.400KHZ
29	ES-733205J	SW LEAF
30	ES-408754M	SW LEAF LSA-1119H
31	ES-408755M	SW LEAF LSA-2127E
32	ES-394427J	SW TACT SOR-133HS T05
33	ET-369248	TR DTA114YS
34	ET-360399	TR DTC114TS
35	ET-354365	TR DTC114YS
36	ET-354371	TR DTC124ES
37	ET-354364	TR DTC143TS
38	ET-353899	TR 2SA1317 S,T,U
39	ET-394919J	TR 2SB1329 Q,R T05
40	*ET-388338J	TR 2SB1425 S,E
41	*ET-397160J	TR 2SC3330 R,S,T,U,V
42	ET-379239	TR 2SD1380 Q,R
43	*ET-396072J	TR 2SD2159 V,W
44	MA-733202J	TURNTABLE CHASSIS ASSY (MB)

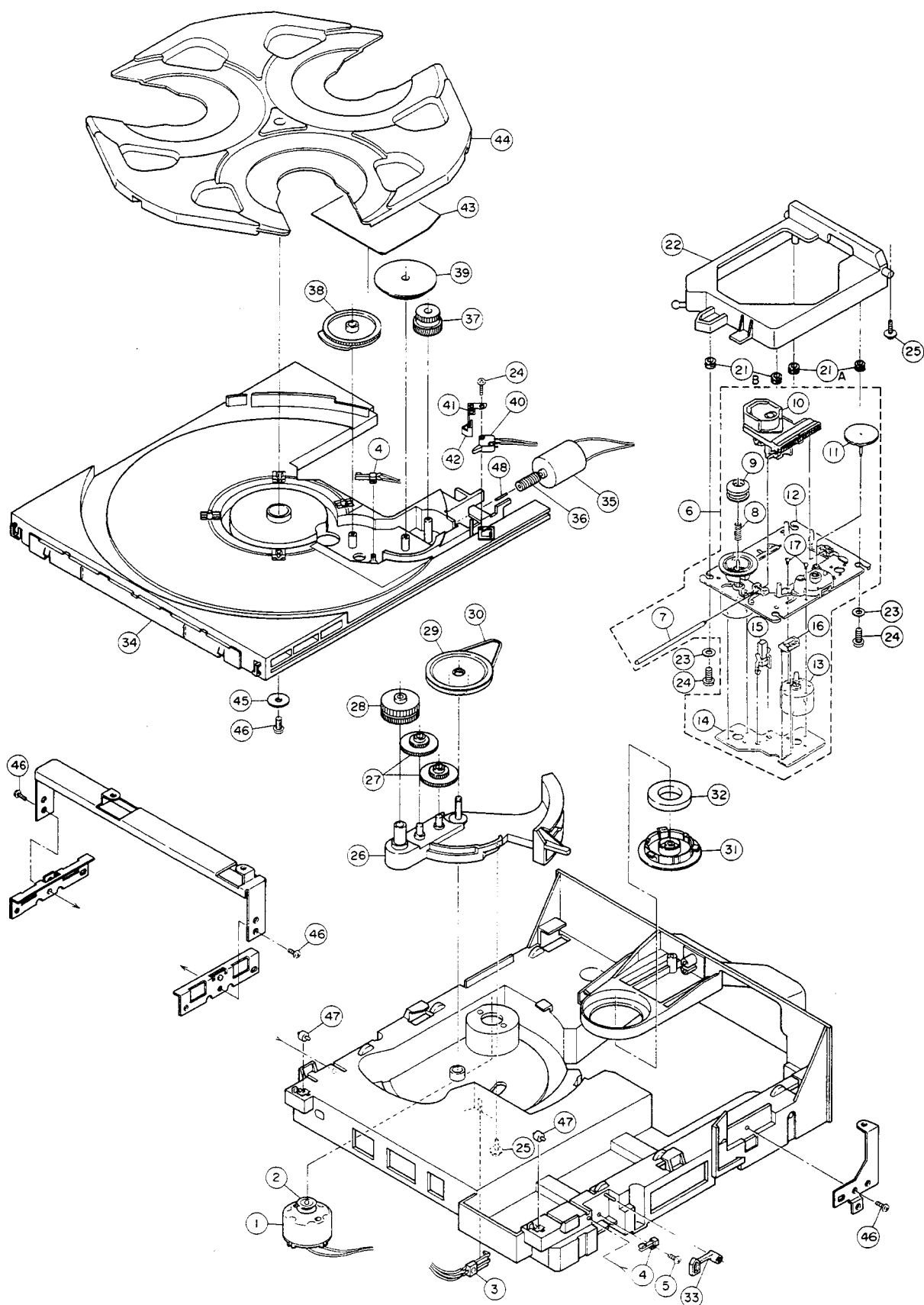
2. CD MECHANISM

Ref.No.	Part No.	Description
1	BM-408752M	MOTOR RF-500TB-14415
2	MR-407764M	PULLEY (SG)
3	ES-408755M	SW LEAF LSA-2127E
4	ES-408754M	SW LEAF LSA-1119H
5	ZS-343082	PT BR26X08STL CMT
6	*BB-408757N	MECHA TRAVERSE KSM-2101ABM
7	MS-733198J	SLIDE SHAFT
8	ZG-733199J	SP COMPRESSION
9	MZ-733200J	CENTER RING (LO)
10	*BO-394728J	PICK UP KSS-210A
11	MZ-733201J	GEAR (A)
12	MA-733202J	TURNTABLE CHASSIS ASSY (MB)
13	BM-733203J	MOTOR GEAR ASSY (MB)
14	EA-733204J	MOTOR P.C BOARD (6P)
15	ES-733205J	SW LEAF
16	EJ-733206J	CONNECTOR 6P
17	ZS-477876	PAN20X03STL CMT
18	EW-408749M	WIRE ASSY YMC-02 PU1 8P
19	EW-408750M	WIRE ASSY YMC-02 PU2 8P
20	EW-408751M	WIRE ASSY YMC-02 TRAVERSE 6P
21A	MB-407746M	INSULATOR (SG)
21B	MB-411992M	INSULATOR (B) (SG)
22	MZ-407745M	HOLDER TRAVERSE (SG)
23	ZW-409219M	PW23X100X100STL BZN (SG)
24	ZS-390395J	BT BID20X10STL BZN
25	ZS-407886M	BT PAN30X08STL BZN C100 (SG)
26	BL-409250M	SG HOLDER GEAR PART
27	MZ-407734J1	GEAR LOADING (B)
28	MZ-407733M	GEAR LOADING (A) (SG)
29	MZ-407763J1	PULLEY GEAR
30	MB-407767M	BELT LOADING (SG)
31	MZ-410907J	CLAMPER (B)
32	MZ-408753J	MAGNET FM30X17X5.2 2P
33	ML-407765J	LEVER SW LOADING
34	SC-407748M	TRAY LOADING (SG)
35	BM-374198	MOTOR RF-370CA-15370
36	MZ-407740J	WORM TABLE
37	MZ-407739M	GEAR WORM WHEEL TABLE (SG)
38	MZ-407737M	GEAR TABLE (A) (SG)
39	MZ-407738M	GEAR TABLE (B) (SG)
40	ES-408758M	SW LEVER SSCTL-S-R
41	ZG-407741M	SP PLATE HOLDER DISK (SG)
42	ML-407742M	LEVER SW (SG)
43	SZ-407750M	COVER GEAR (SG)
44	MZ-407749M	HOLDER DISK (SG)
45	ZW-396336M	PW30X150X080STL CMT (SG)
46	ZS-331182	BT BID30X08STL BNI
47	MR-407755M	ROLLER
48	MS-411215J	SHAFT WORM

NOTE:

Parts will not be supplied if they are not listed in the parts list, even if they appear on the assembling illustrations with reference No.

# CD MECHANISM



### 3. P.C BOARD BLOCK

Ref.No.	Part No.	Description
1	BA-P2069T030A	ML PC (#) CD BLK CD-650/ML

PC (#) CD BLK CONSISTS OF FOLLOWING P.C BOARD.

- MAIN P.C BOARD
- FRONT P.C BOARD

### 4. MAIN P.C BOARD

Ref.No.	Part No.	Description
D1	*ED-511907	D SILICON 1N4002 100/1.0A
D2	*ED-511907	D SILICON 1N4002 100/1.0A
D3	*ED-511907	D SILICON 1N4002 100/1.0A
D4	*ED-511907	D SILICON 1N4002 100/1.0A
D5	*ED-511907	D SILICON 1N4002 100/1.0A
D6	*ED-511907	D SILICON 1N4002 100/1.0A
D7	*ED-400171J	D ZENER H HZS6C2L
D9	*ED-400171J	D ZENER H HZS6C2L
D11	ED-307572	D SILICON H 1SS131
D12	ED-307572	D SILICON H 1SS131
D13	ED-307572	D SILICON H 1SS131
D14	ED-403743J	D ZENER H HZS6B3
D15	ED-400171J	D ZENER H HZS6C2L
D16	ED-408721J	D ZENER H HZS2B3
D17	ED-408720J	D ZENER H HZS3C1
D18	ED-408719J	D ZENER H HZS4C2
D19	ED-307572	D SILICON H 1SS131
D20	ED-307572	D SILICON H 1SS131
IB1	EH-404307J	COMP R RGL13X 223J
IB2	EH-408654J	COMP R RGL10T 223J
IB3	EH-408656J	COMP R RGL6X 472J
IC1	EI-408657J1	IC M38002M4-126SP MXA1CD2
IC2	EI-390120J	IC CXA1082BS
IC3	EI-390112J	IC CXA1081S
IC4	EI-403497J	IC CXD1167Q
IC5	EI-408658J	IC PCM67U
IC6	EI-393325J	IC M5218AP
IC7	EI-213390	IC NJM4558D
IC8	EI-387938J	IC HD74LS05P
IC9	EI-389264J	IC BA6209N
IC10	EI-330352	IC BA6109
J4	EJ-408660J	SOCKET CFG1111-0161 BLUE 11P
R50	*ER-394882J	R OMF V T05 FS 1/2W 1R2J
R53	*ER-394882J	R OMF V T05 FS 1/2W 1R2J
TR1	*ET-397160J	TR 2SC3330 R,S,T,U,V
TR2	*ET-396072J	TR 2SD2159 V,W
TR3	*ET-396072J	TR 2SD2159 V,W
TR4	ET-396072J	TR 2SD2159 V,W
TR5	ET-353899	TR 2SA1317 S,T,U
TR6	*ET-388338J	TR 2SB1425 S,E
TR7	ET-353899	TR 2SA1317 S,T,U
TR8	ET-397160J	TR 2SC3330 R,S,T,U,V
TR9	ET-360399	TR DTC114TS
TR10	ET-354365	TR DTC114YS
TR11	ET-397160J	TR 2SC3330 R,S,T,U,V
TR12	ET-397160J	TR 2SC3330 R,S,T,U,V
TR13	ET-397160J	TR 2SC3330 R,S,T,U,V
TR14	ET-360399	TR DTC114TS
TR15	ET-360399	TR DTC114TS
TR16	ET-354371	TR DTC124ES
TR17	ET-354364	TR DTC143TS
TR18	ET-354364	TR DTC143TS
TR19	ET-369248	TR DTA114YS
TR21	ET-379239	TR 2SD1380 Q,R
TR22	ET-388338J	TR 2SB1425 S,E
TR23	ET-379239	TR 2SD1380 Q,R
TR24	ET-394919J	TR 2SB1329 Q,R T05
TR25	ET-396072J	TR 2SD2159 V,W
TR26	ET-388338J	TR 2SB1425 S,E
TR27	ET-396072J	TR 2SD2159 V,W
TR28	ET-388338J	TR 2SB1425 S,E
TR29	ET-354365	TR DTC114YS
TR30	ET-354365	TR DTC114YS
TR31	ET-354365	TR DTC114YS
VR1	EV-404260J	R S-FIX H RH0681C 0.30W 102
VR2	EV-358829	R S-FIX H RH0615C 0.10W 223
VR3	EV-358829	R S-FIX H RH0615C 0.10W 223

Ref.No.	Part No.	Description
VR4	EV-358829	R S-FIX H RH0615C 0.10W 223
VR5	EV-356576	R S-FIX H RH0615C 0.10W 472
X1	EI-381139J	OSC XTAL HC-49/U 16934.400KHZ
X2	EI-390149J	OSC CE CST4.23MGW 4.230MHZ

### 5. FRONT P.C BOARD

Ref.No.	Part No.	Description
D201	ED-408651J	D LED SEL2913K ORANGE
D202	ED-408651J	D LED SEL2913K ORANGE
D203	ED-408651J	D LED SEL2913K ORANGE
TS201	ES-394427J	SW TACT SOR-133HS T05
TS202	ES-394427J	SW TACT SOR-133HS T05
TS203	ES-394427J	SW TACT SOR-133HS T05
TS204	ES-394427J	SW TACT SOR-133HS T05
TS205	ES-394427J	SW TACT SOR-133HS T05
TS206	ES-394427J	SW TACT SOR-133HS T05
TS207	ES-394427J	SW TACT SOR-133HS T05
TS208	ES-394427J	SW TACT SOR-133HS T05
TS209	ES-394427J	SW TACT SOR-133HS T05
TS210	ES-394427J	SW TACT SOR-133HS T05

### 6. FINAL ASSEMBLY

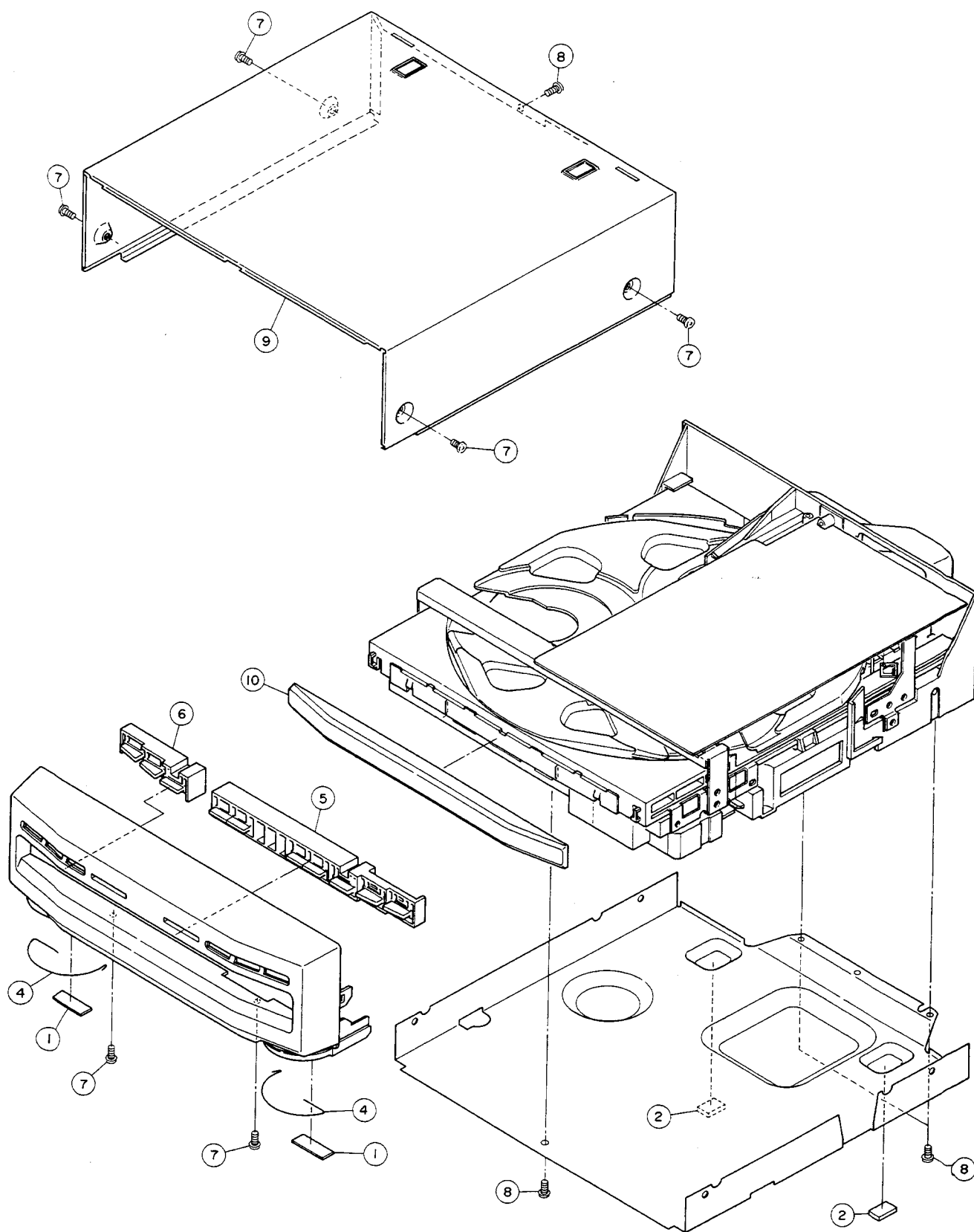
Ref.No.	Part No.	Description
1	SA-394136M	CUSHION FOOT (SG)
2	SA-407840M	CUSHION FOOT REAR (SG)
3	SP-408018M	PANEL FRONT (SG)
4	SZ-407871M	RING FOOT (A) (SG)
5	SB-408020M	BUTTON OP (SG)
6	SB-408021M	BUTTON OPEN (SG)
7	ZS-331182	BT BID30X08STL BNI
8	ZS-366385	T2BR30X08STL BNI PROJECTION
9	SP-408022M	COVER UPPER (SG)
10	SP-408023M	COVER TRAY (SG)

#### NOTE:

Parts will not be supplied if they are not listed in the parts list, even if they appear on the assembling illustrations with reference No.



# FINAL ASSEMBLY



# INDEX

Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.
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BM374198	2-35	ET360399	4-TR15				
BM408752M	2-1	ET369248	4-TR19				
BM733203J	2-13	ET379239	4-TR21				
BO394728J	2-10	ET379239	4-TR23				
EA733204J	2-14	ET388338J	4-TR6				
ED307572	4-D11	ET388338J	4-TR22				
ED307572	4-D12	ET388338J	4-TR26				
ED307572	4-D13	ET388338J	4-TR28				
ED307572	4-D19	ET394919J	4-TR24				
ED307572	4-D20	ET396072J	4-TR2				
ED400171J	4-D7	ET396072J	4-TR3				
ED400171J	4-D9	ET396072J	4-TR4				
ED400171J	4-D15	ET396072J	4-TR25				
ED403743J	4-D14	ET396072J	4-TR27				
ED408651J	5-D201	ET397160J	4-TR1				
ED408651J	5-D202	ET397160J	4-TR8				
ED408651J	5-D203	ET397160J	4-TR11				
ED408719J	4-D18	ET397160J	4-TR12				
ED408720J	4-D17	ET397160J	4-TR13				
ED408721J	4-D16	EV356576	4-VR5				
ED511907	4-D1	EV358829	4-VR2				
ED511907	4-D2	EV358829	4-VR3				
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ES394427J	5-TS202	MZ733200J	2-9				
ES394427J	5-TS203	MZ733201J	2-11				
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## ABBREVIATIONS (COMPACT DISC)

ABBREVIATION	EXPLANATION	ABBREVIATION	EXPLANATION
A-D	Analog to Digital (Convertor)	Mb	Mega Bits
ADC	Analog to Digital (Convertor)	MDA	Mortor Drive Amplifier
BCD	Binary Code Decimal	MFM	Modified Frequency Modulation
BPI	Bits per Inch	MM	Mono-stable Multivibrator
CD	Compact Disc	M <sup>2</sup> FM	Modified Modified Frequency Modulation
CIRC	Cross Interleaving & Reed Solomon Coding	MOD2	Modulo 2 (Addition)
CLV	Constant Linear Velocity	MP	Microprocessor
CP	Clock Pulses	MSB	Most Significant Bit
CRCC	Cyclic Redundancy Check Codes	NA	Numerical Aperture
D Level	Decision Level	NRZ	Non Return to Zero
D-A	Digital to Analog (Convertor)	NRZ-1	Non Return to Zero Inverted
DAC	Digital to Analog (Convertor)	P	Parity Data
DAD	Digital Audio Disc	PAM	Pulse Amplitude Modulation
DEM	Dynamic Element Matching	PCM	Pulse Code Modulation
DPD	Differential Phase Detection	PD	Phase Detector
DSV	Digital Sum Value	PE	Phase Encode
EFM	Eight to fourteen Modulation	PLL	Phase Locked Loop
EX-OR	EXclusive OR	PNM	Pulse Number Modulation
FCI	Flux Changes per Inch	PPM	Pulse Phase Modulation
FIR	Finite Impulse Response	PWM	Pulse Width Modulation
FP	Front Pulse	Q	Parity Data
FPG	Front Pulse Gate	R, R <sub>1</sub> , R <sub>2</sub> , etc.	Data for Right Channel
f	Frequency of Sampling	RAM	Random Access Memory
GF	Galois Field	RPG	Rear Pulse Gate
H & V (Parity)	Horizontal & Vertical	SCOOP	Self Coupled Optical Pick-up
IIR	Infinite Impulse Response	S & H	Sample & Hold
kb	Kilo Bits	S/N	Signal to Noise Ratio
L, L <sub>1</sub> , L <sub>2</sub> , etc.	Data for Left Channel	SSG	Standard Signal Generator
LPF	Low Pass Filter	SYSCON	SYStem CONtrol
LSB	Least Significant Bit		

**AKAI ELECTRIC CO., LTD.**

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Printed No. 920310-A1-4176 Printed Date March 25, 1992

350 Printed in Japan

# AKAI

**MODEL MX-550**  
(TP-550, AX-550, CD-650)

**MODEL MX-650**  
(TP-650, AX-650, CD-650)

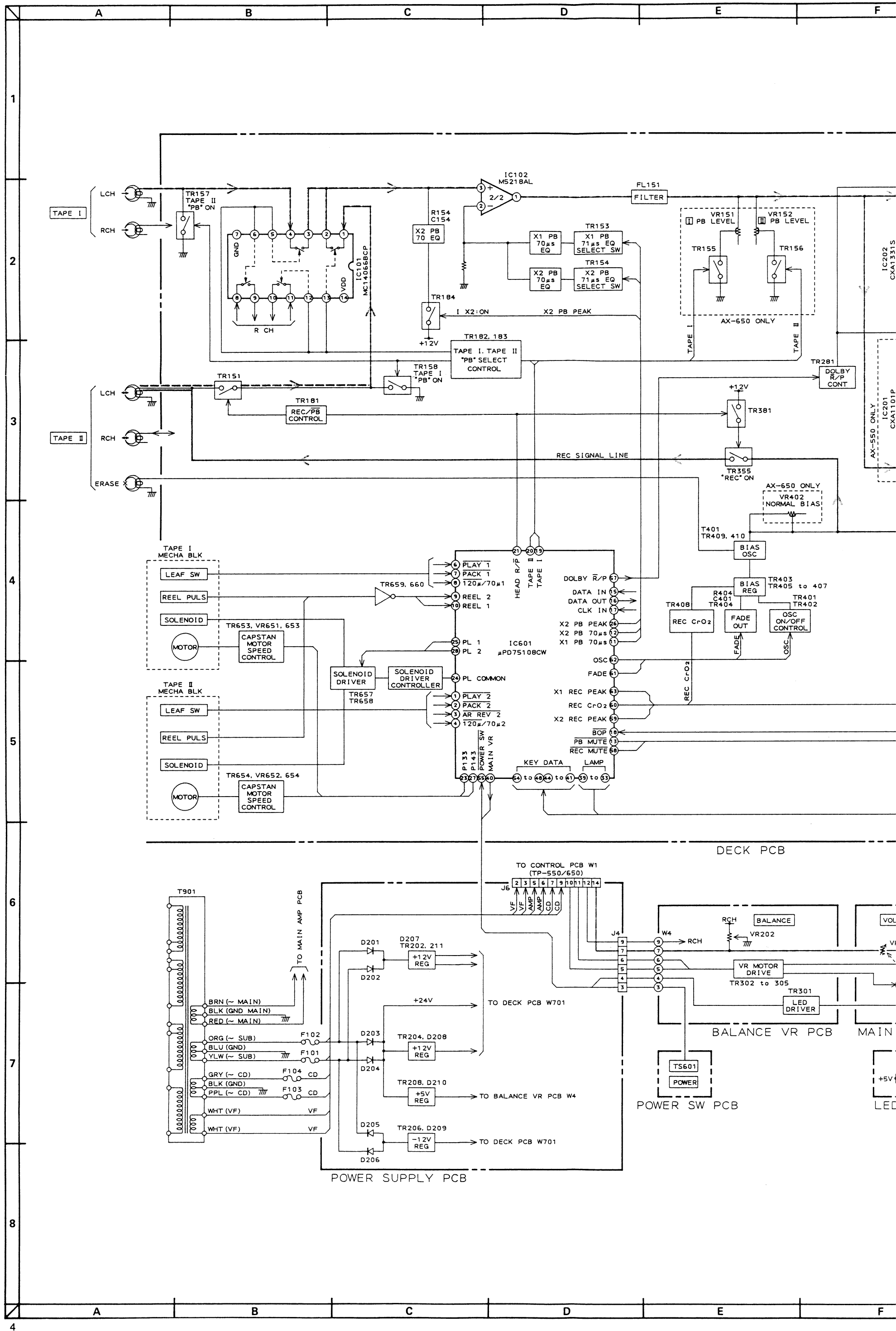
## SCHEMATIC DIAGRAMS AND PC BOARDS

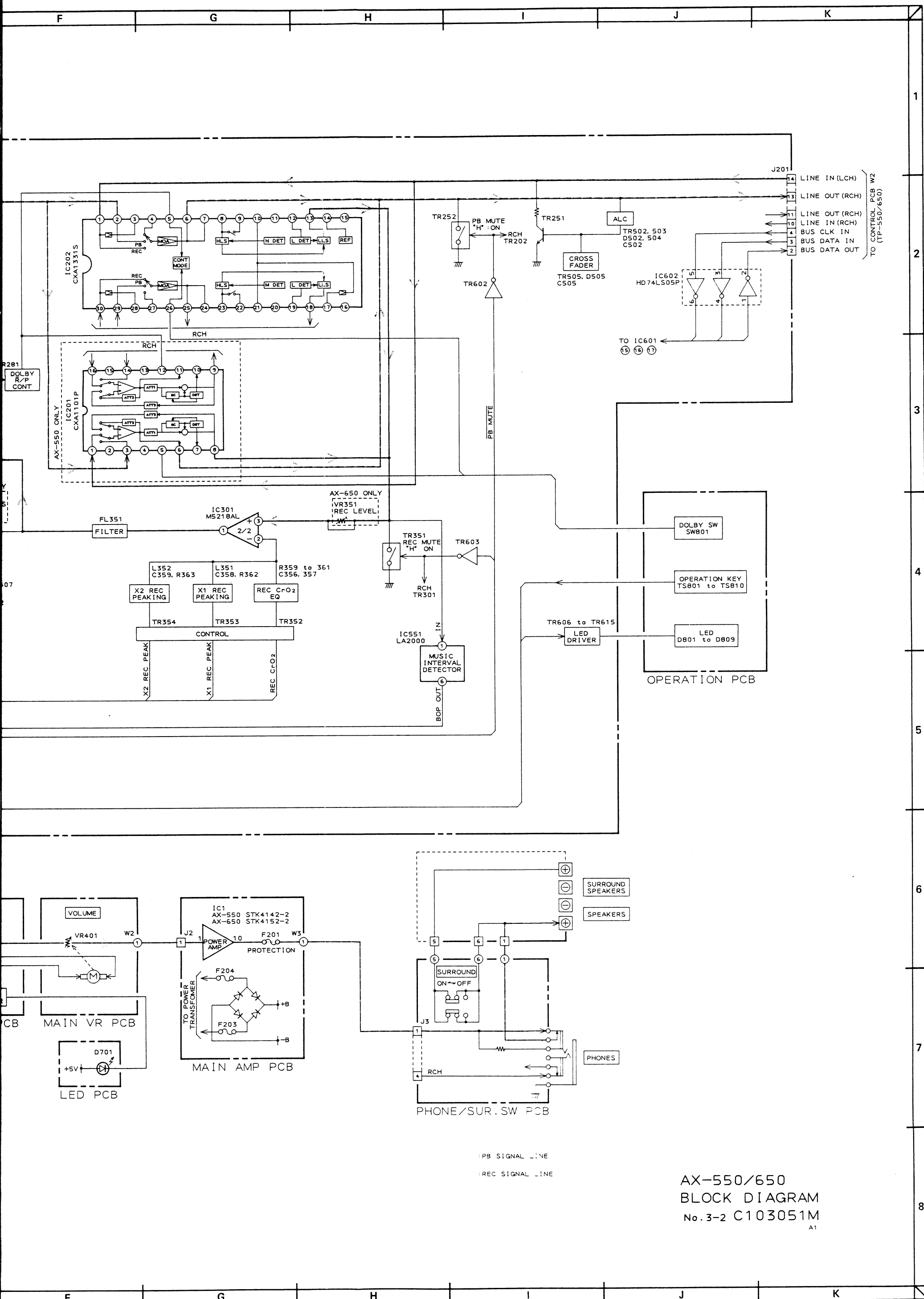
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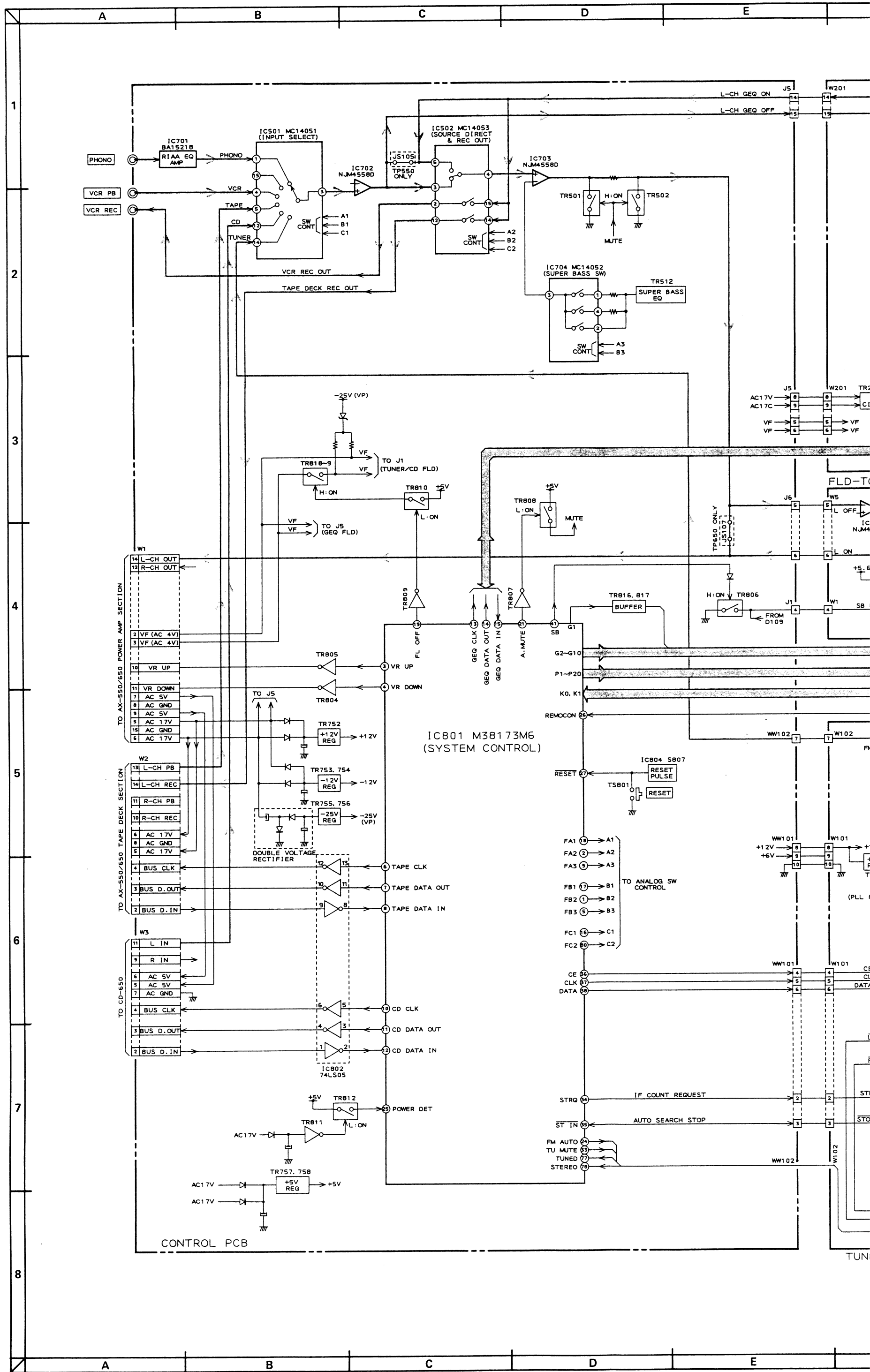
Use these schematic diagrams and PC boards together with the provided service manual.

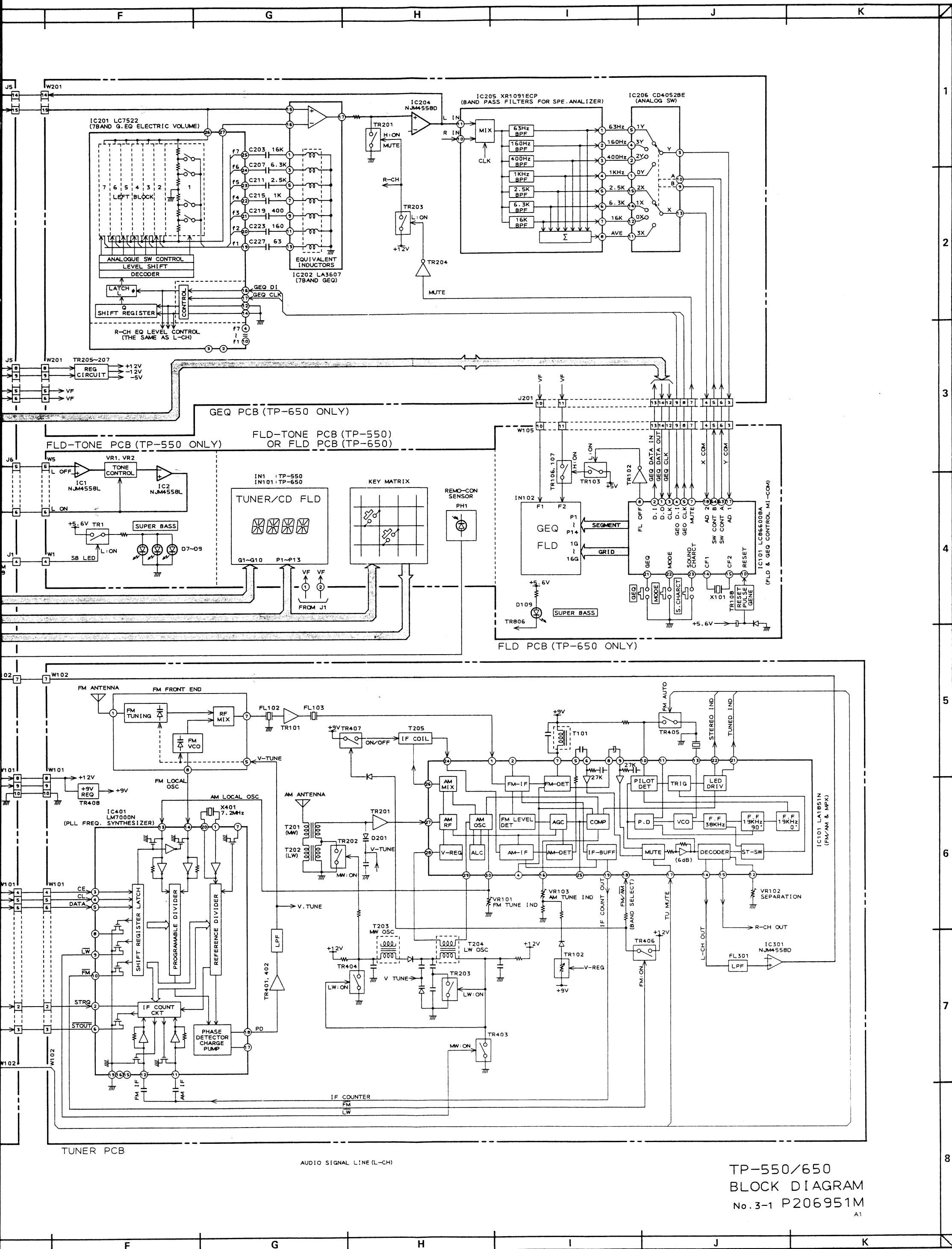


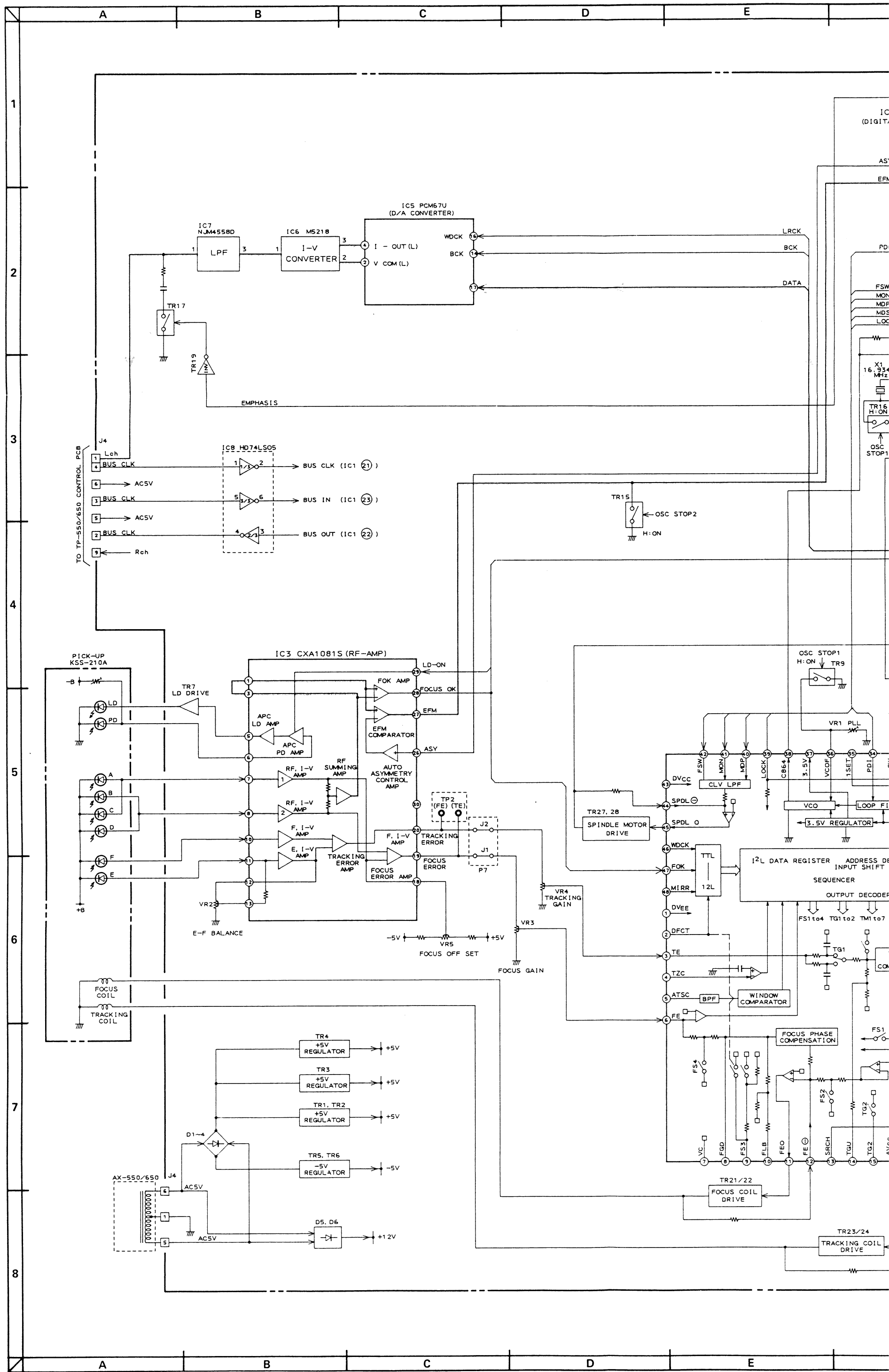


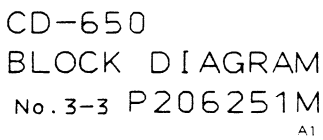


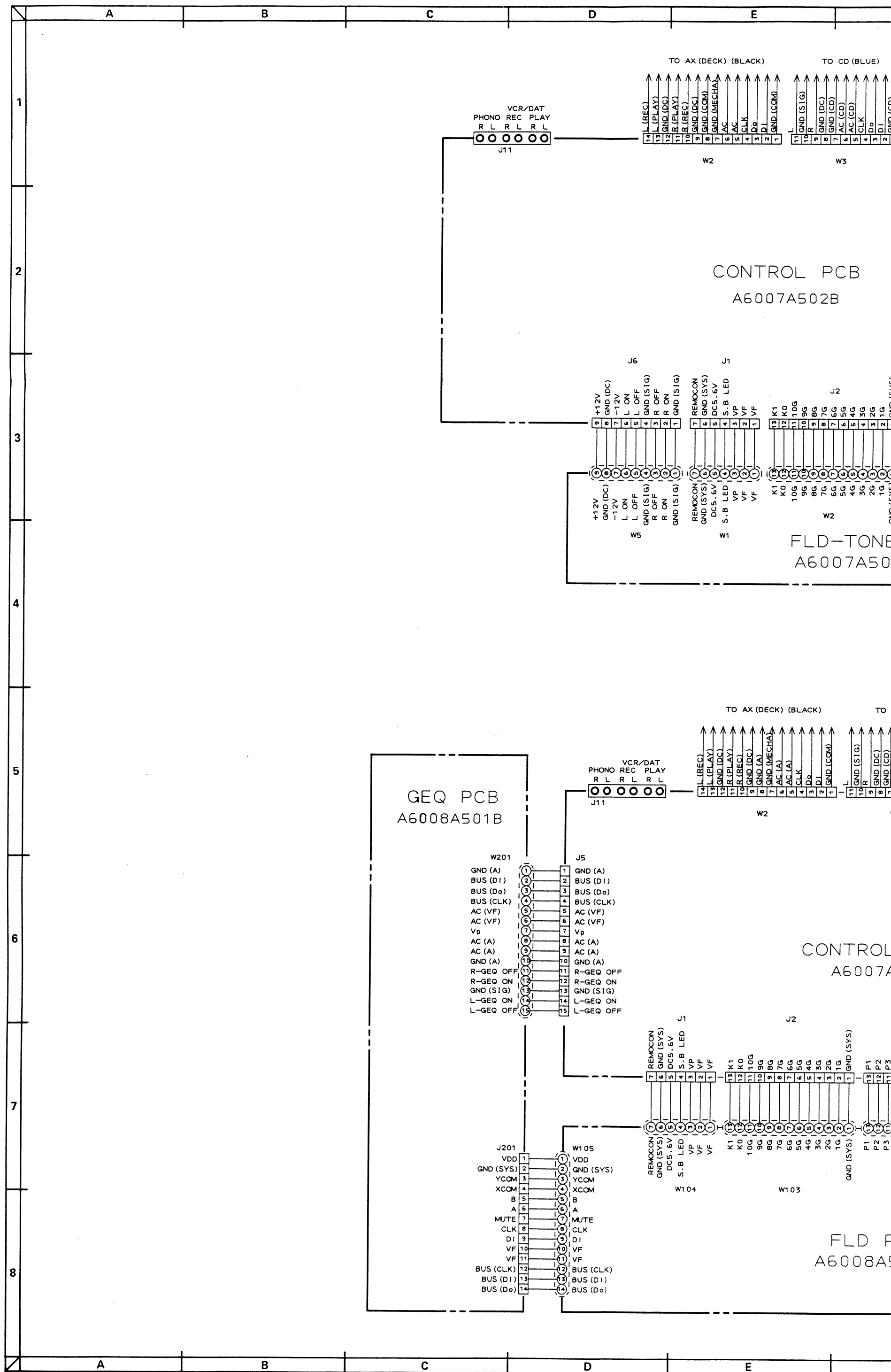


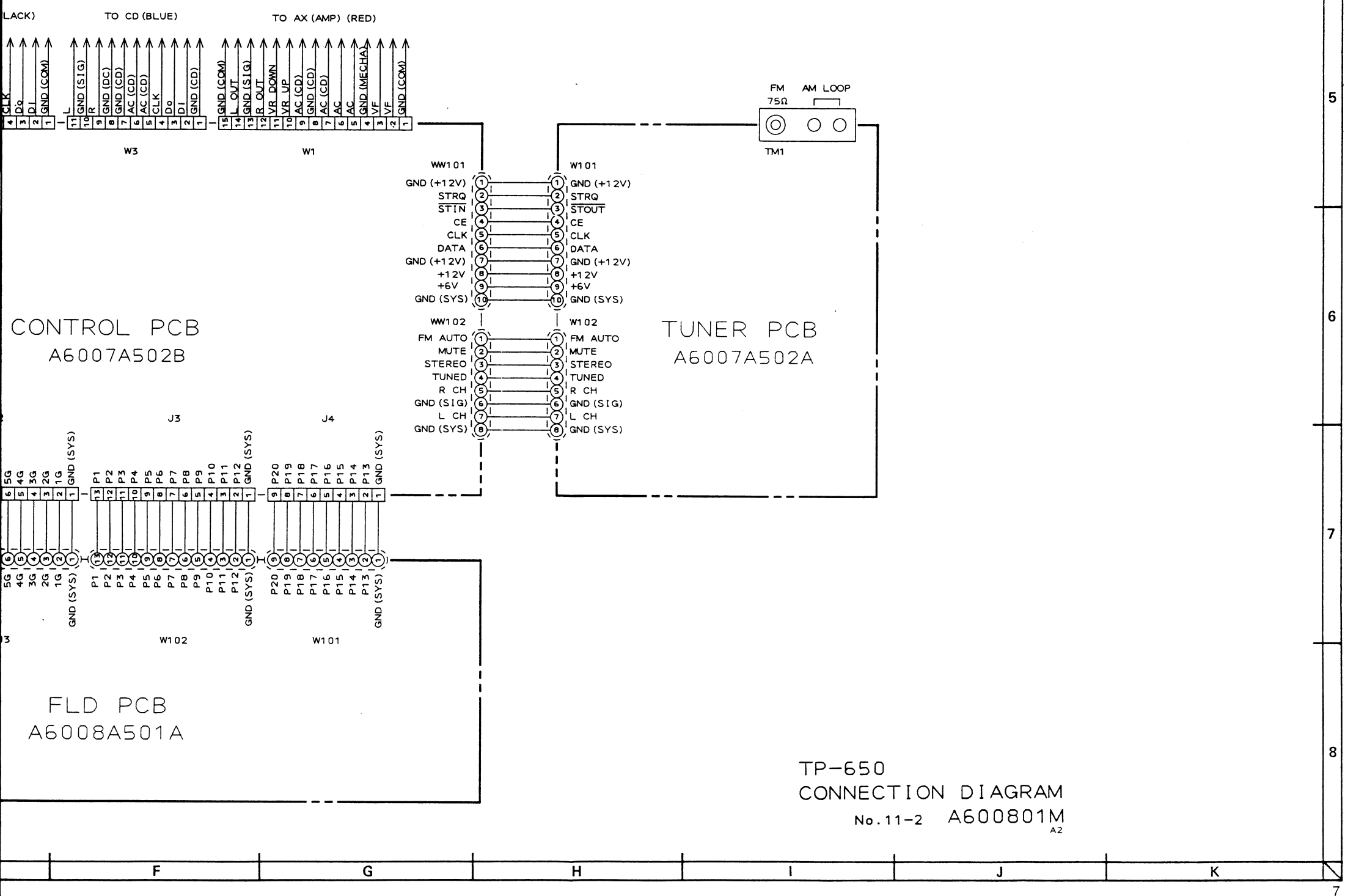
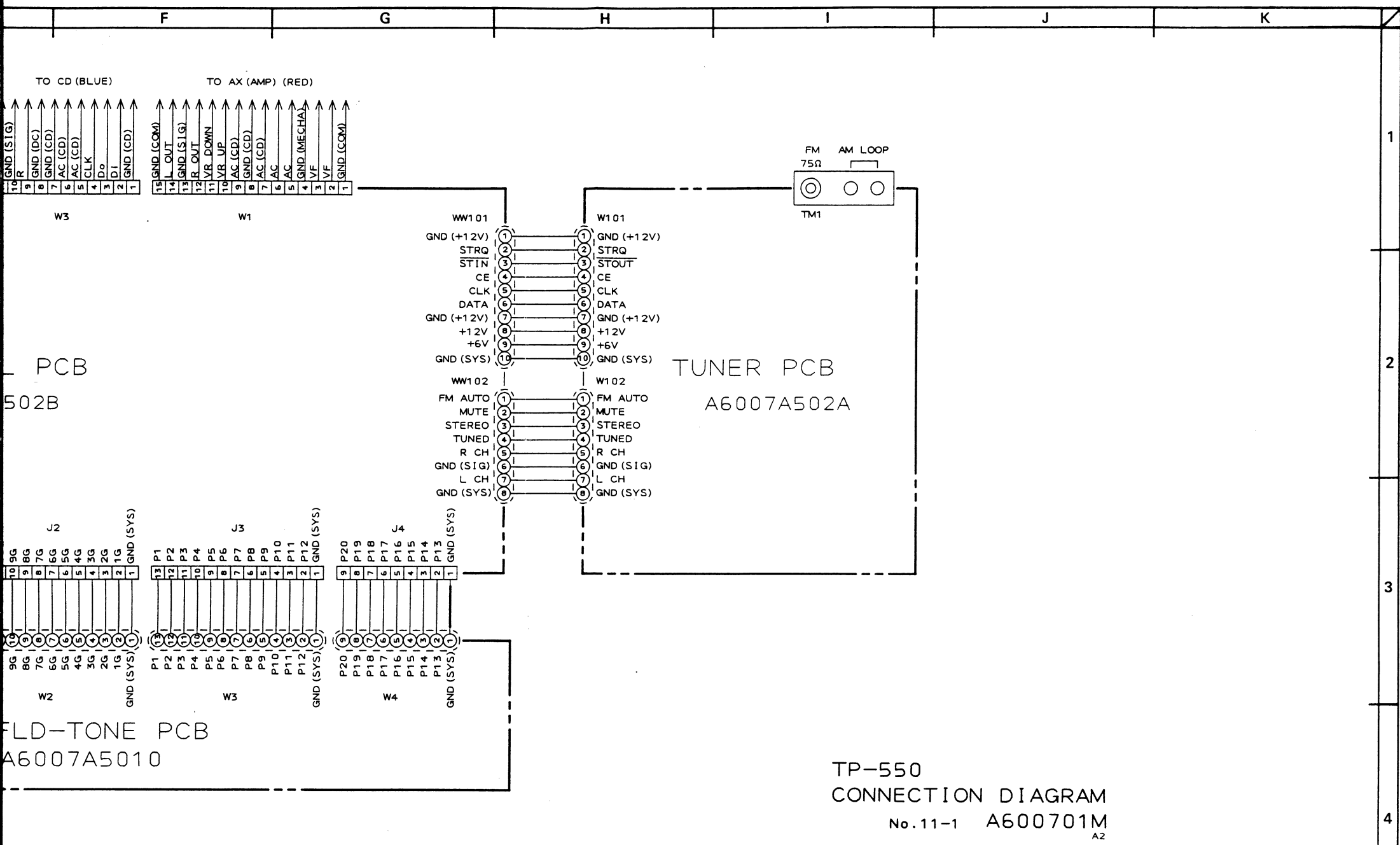


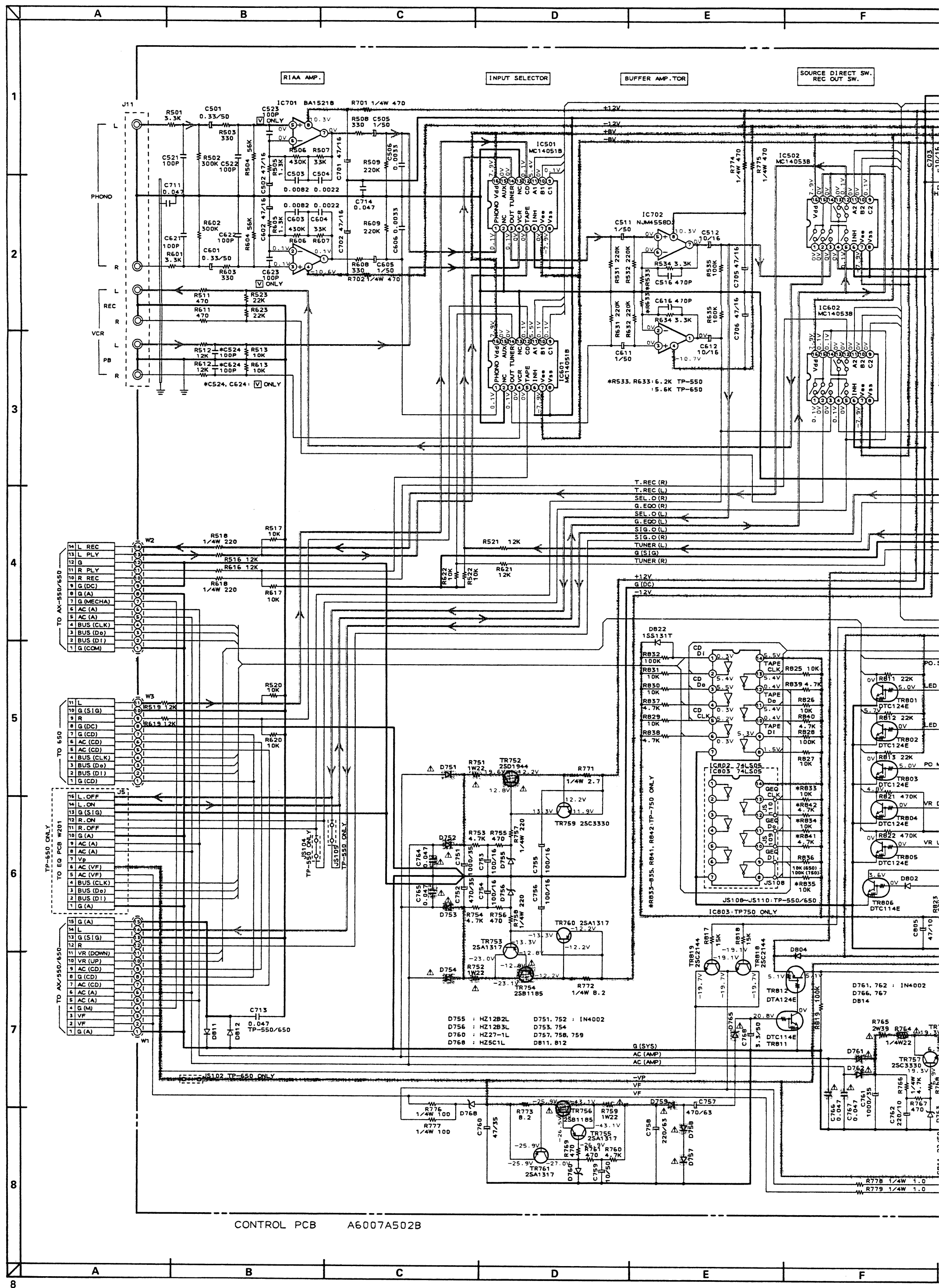




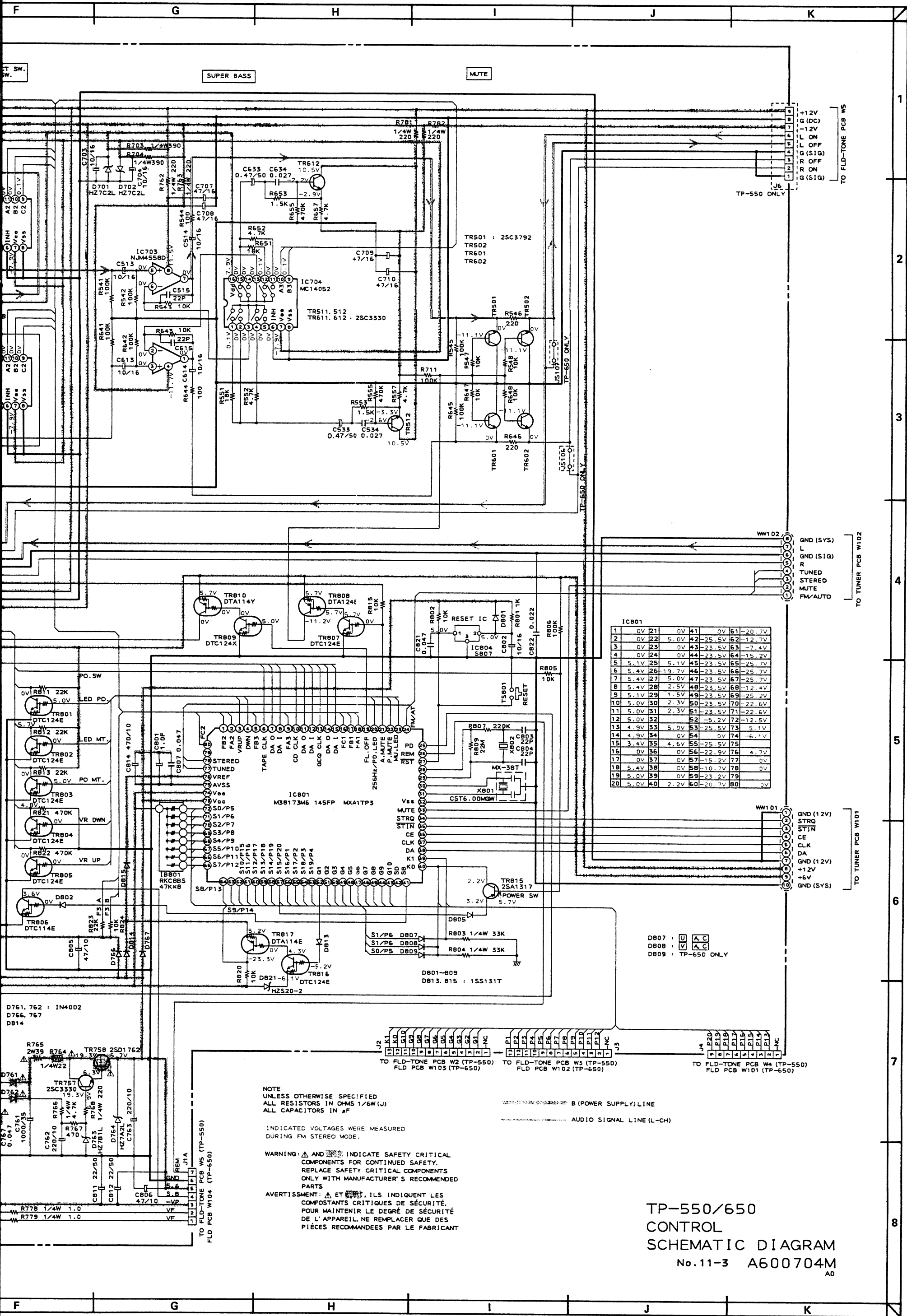




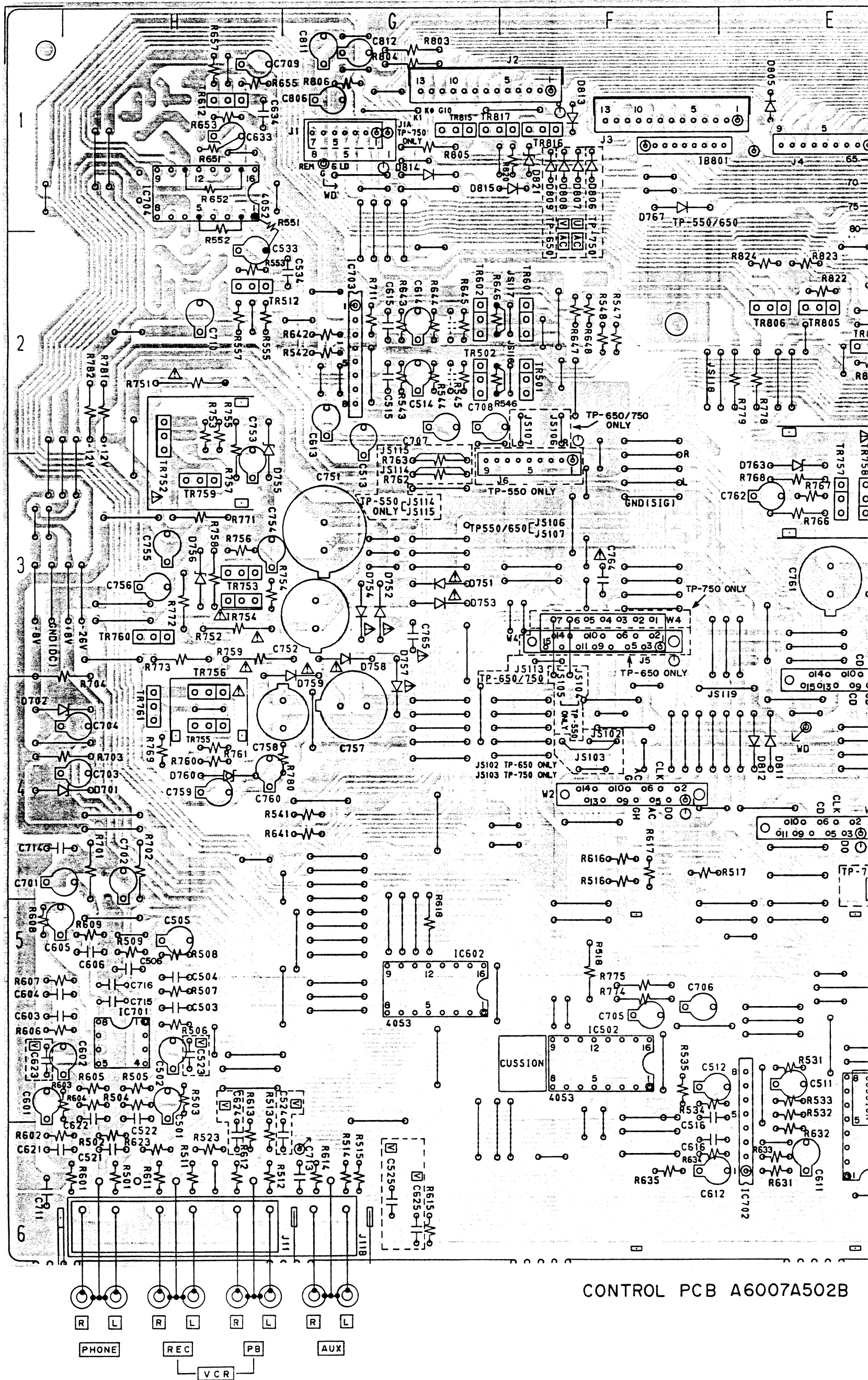


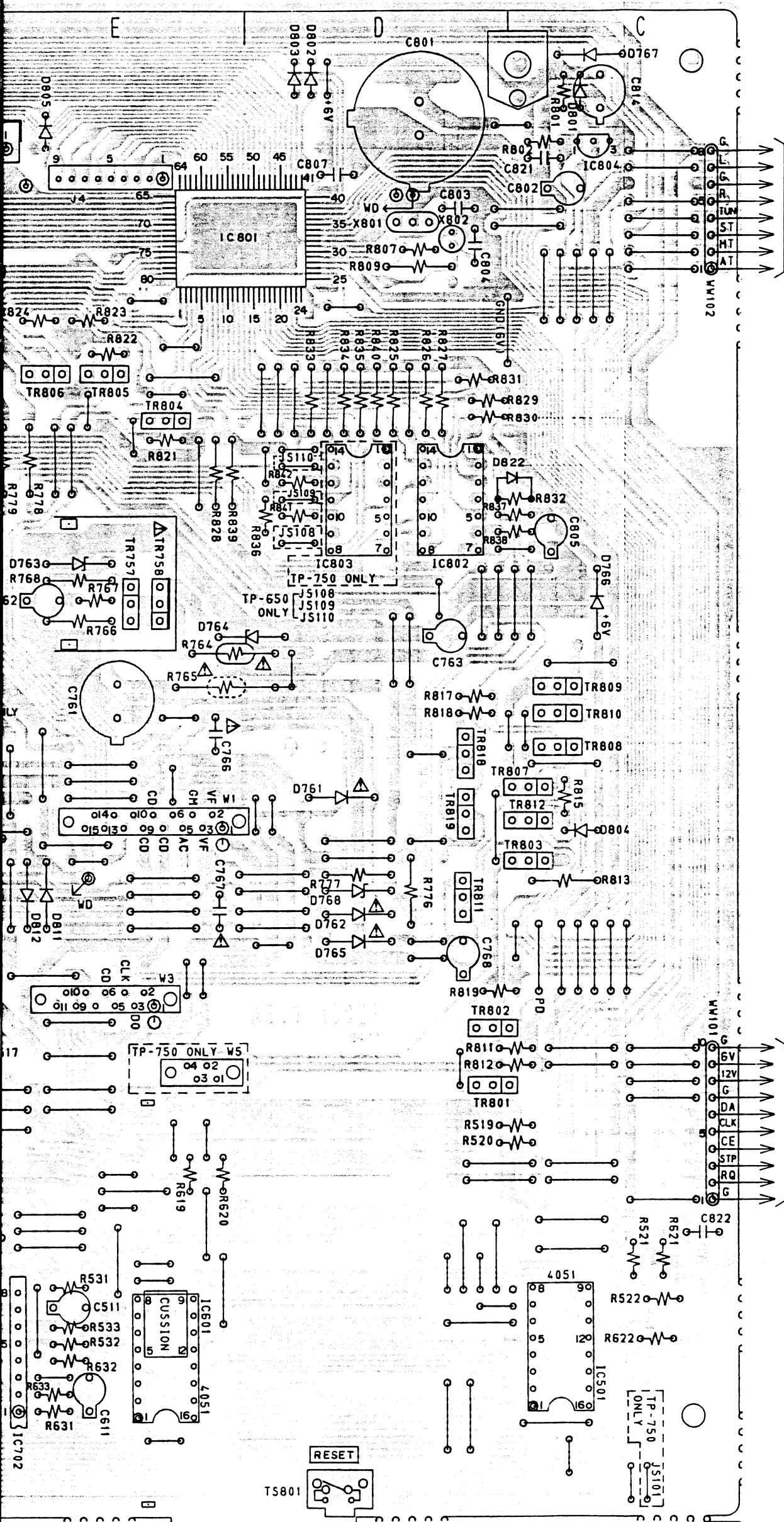












TO TUNER PCB  
(JS14 ~ JS21 : TP-550/650 ONLY)

TO TUNER PCB  
(JS4 ~ JS13 : TP-550/650 ONLY)

# PRINCIPAL PARTS LOCATION

ICs			
IC101	B2,3	TR753	H3
IC301	B1	TR754	H3
IC401	B4,5	TR755	H4
IC501	C5,6	TR756	H4
IC502	F5	TR757	E3
IC601	E5,6	TR758	E3
IC602	G5	TR759	H3
IC701	H5	TR760	H3
IC702	E5,6	TR761	H4
IC703	G2	TR801	D5
IC704	H1	TR802	D4
IC801	D,E1	TR803	C4
IC801A	D,E1	TR804	E2
IC802	D2,3	TR805	E2
IC803	D2,3	TR806	E2
IC804	C1	TR807	C3
TRANSISTORS			
TR101	B3	TR808	C3
TR201	A3	TR809	C3
TR202	A4	TR810	C3
TR203	A3	TR811	D4
TR401	B5	TR812	C4
TR402	B5,6	TR815	G1
TR403	B4	TR816	F1
TR404	B4	TR817	F,G1
TR405	B2	TR818	D3
TR406	A4	TR819	D3,4
TR407	A4	CONNECTORS	
TR408	B4	J1,J1A	G1
TR501	F2	J2	F,G1
TR502	G2	J3	E,F1
TR512	H2	J4	E1
TR601	F2	J5	F3
TR602	G2	J6	F,G3
TR612	H1	J11,11A,B,C	G,H6
TR752	H2	J101	B3

WARNING: INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.

AVERTISSEMENT: IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT.

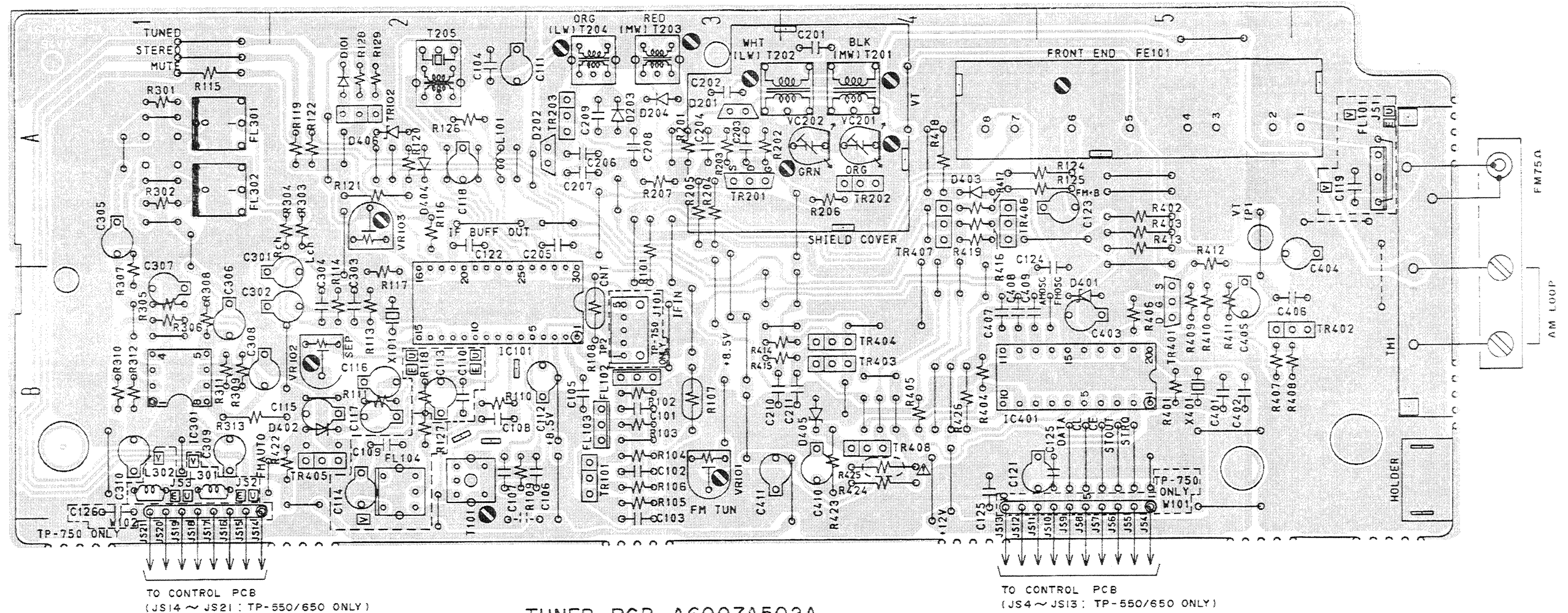
A6007A502B

NOTE : PARTS DIFFER DEPENDING ON MODEL NUMBER. REFER TO SCHEMATIC DIAGRAMS FOR PERTAINING PARTS INFORMATION.







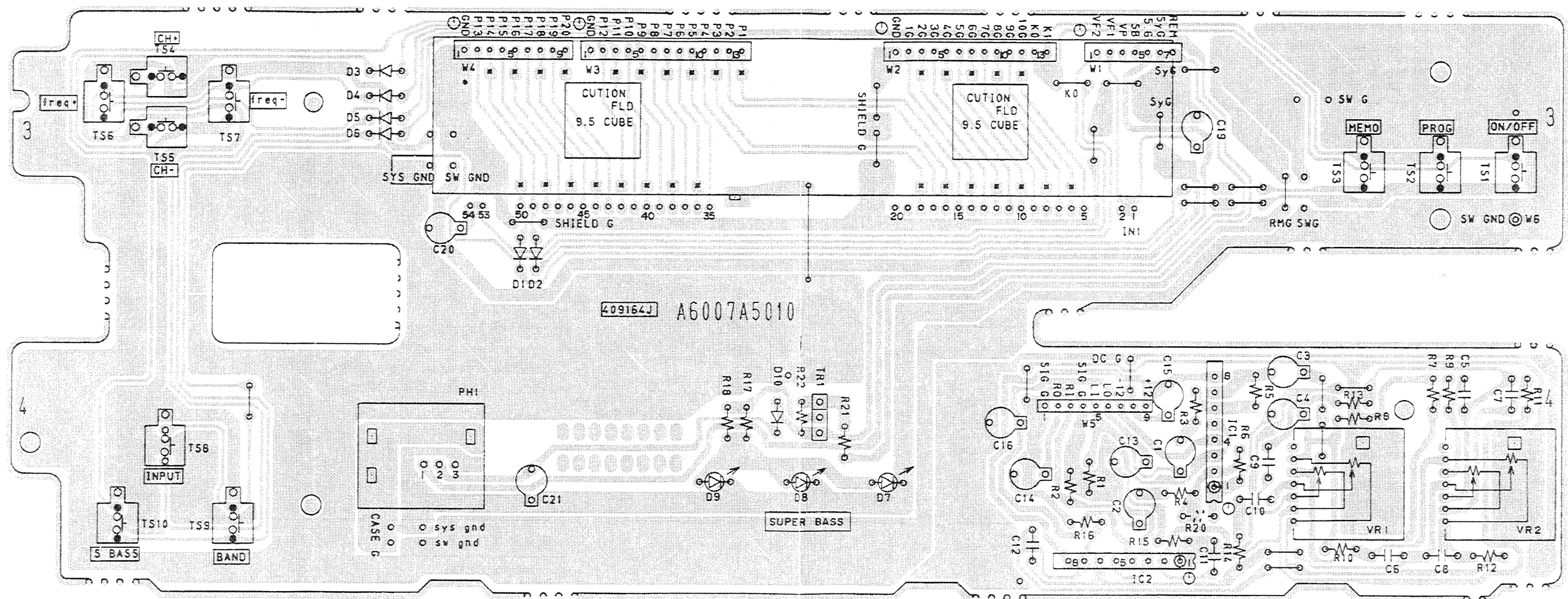


TUNER PCB A6007A502A

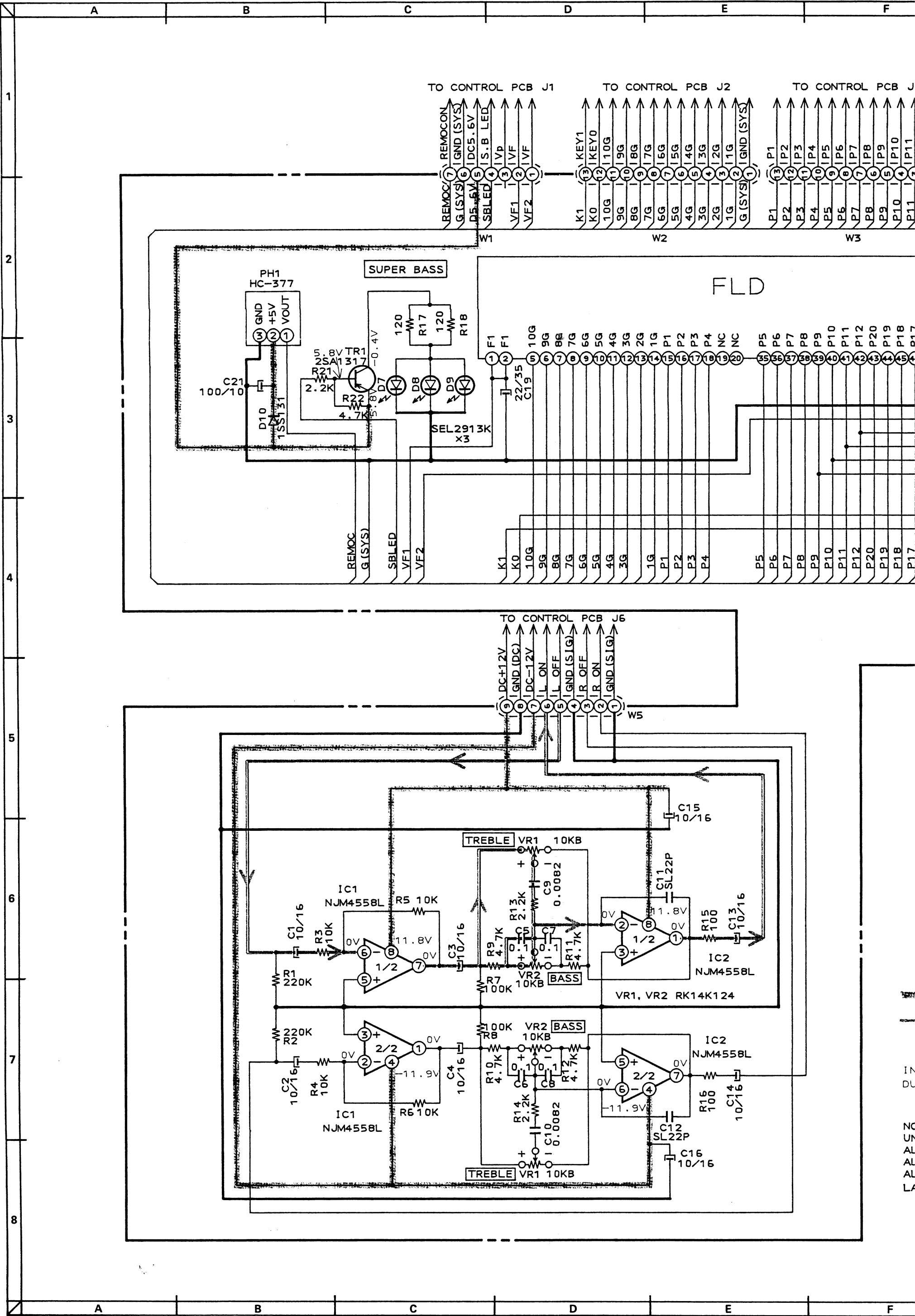
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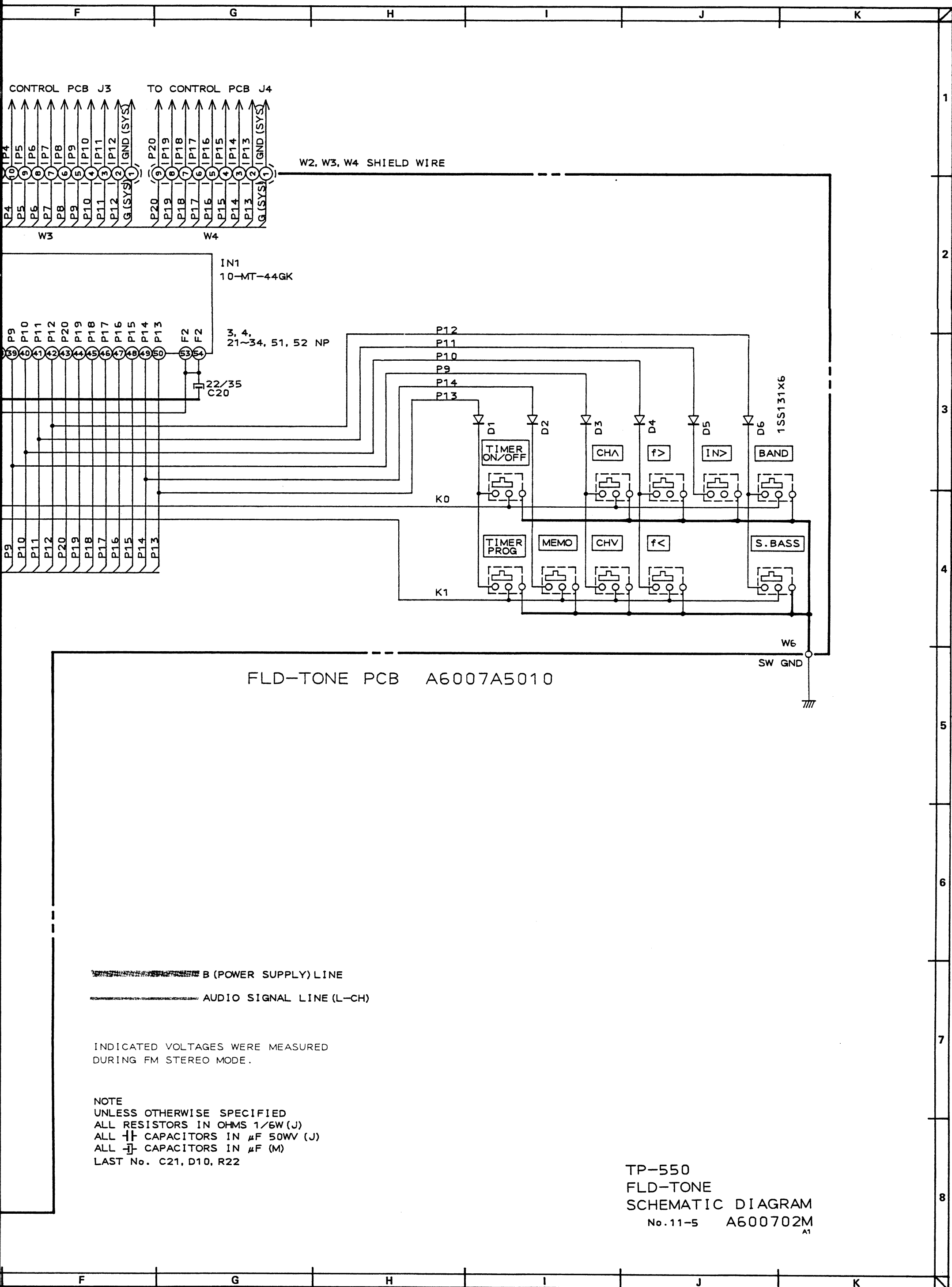
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NOTE: PARTS DIFFER DEPENDING ON MODEL NUMBER. REFER TO SCHEMATIC DIAGRAMS FOR PERTAINING PARTS INFORMATION.



FLD - TONE PCB A6007A5010







TO CONTROL PCB J5

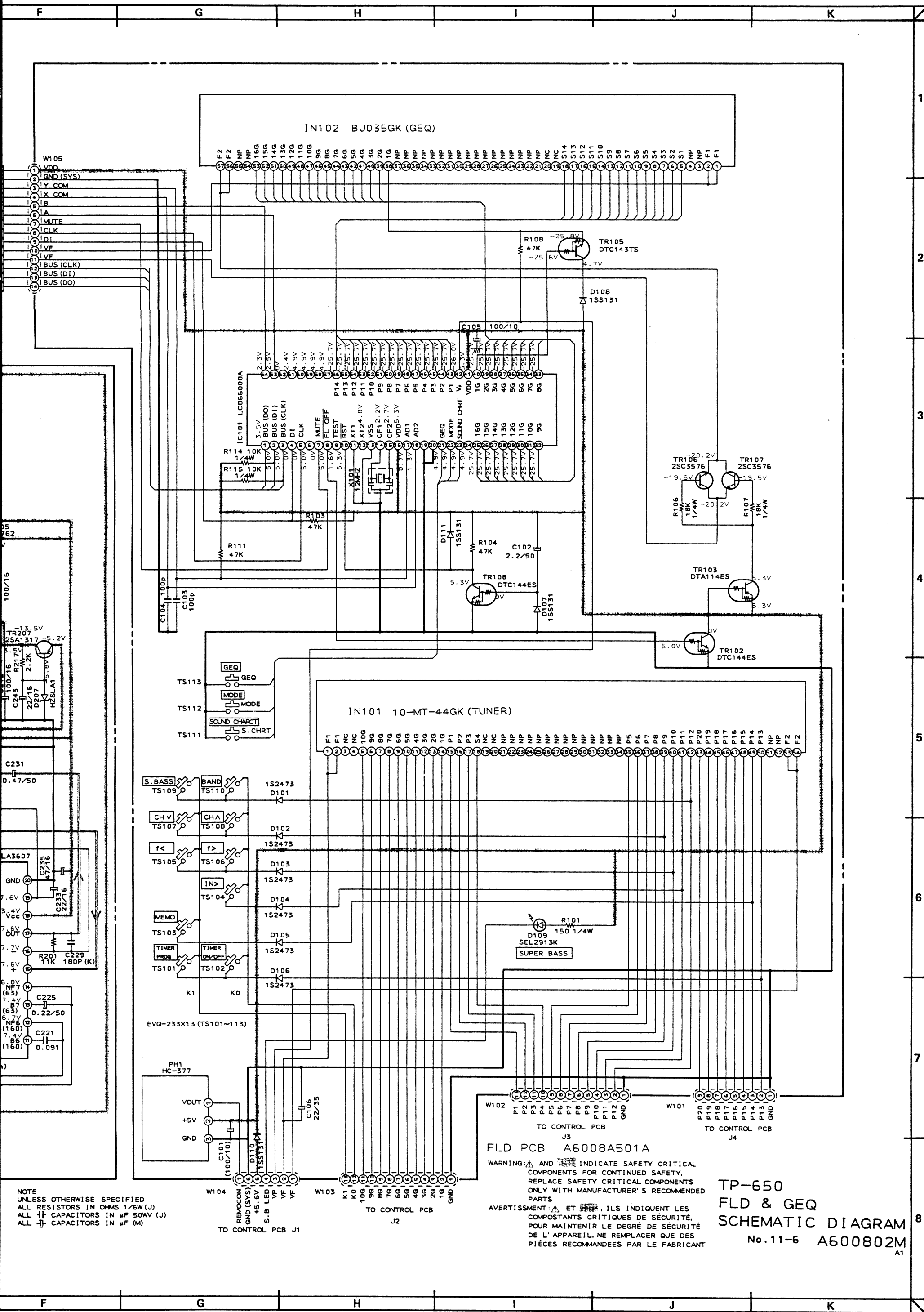
GEQ PCB A6008A501B

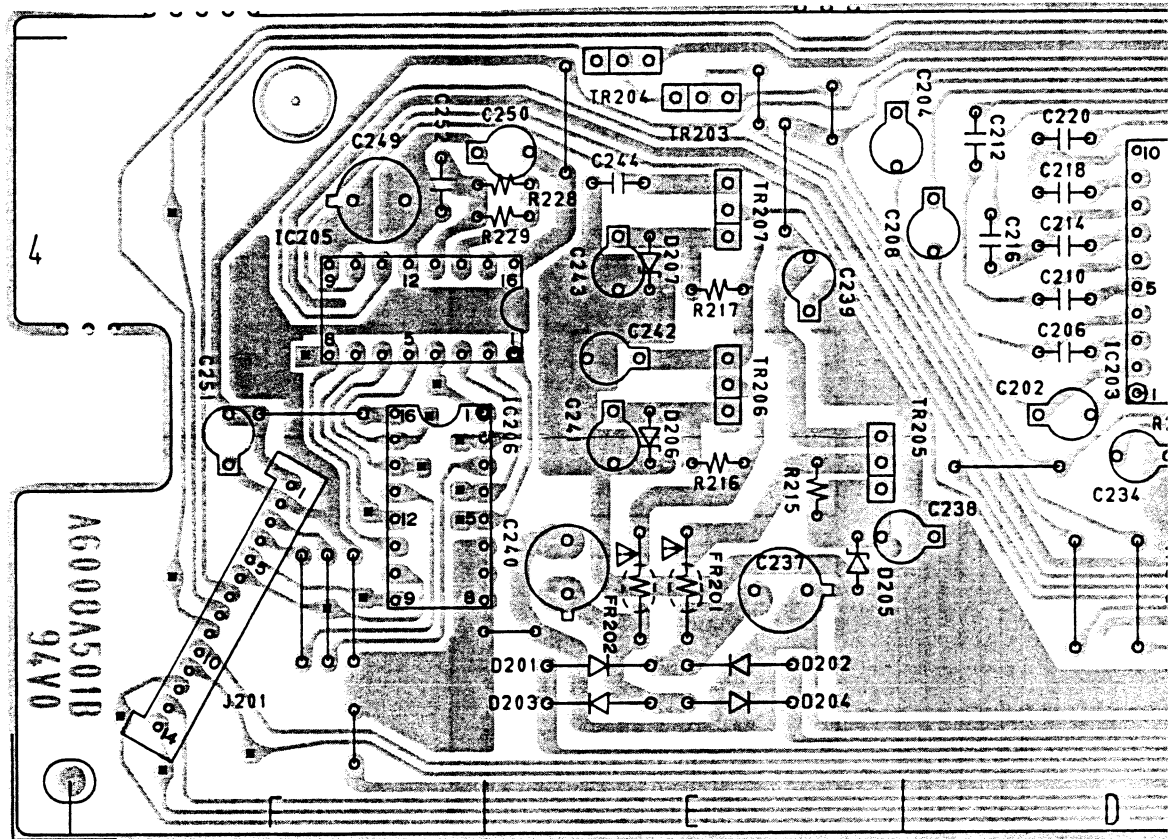
INDICATED VOLTAGES WERE MEASURED WHEN NO SIGNAL WAS BEING INPUT.

--- B (POWER SUPPLY) LINE

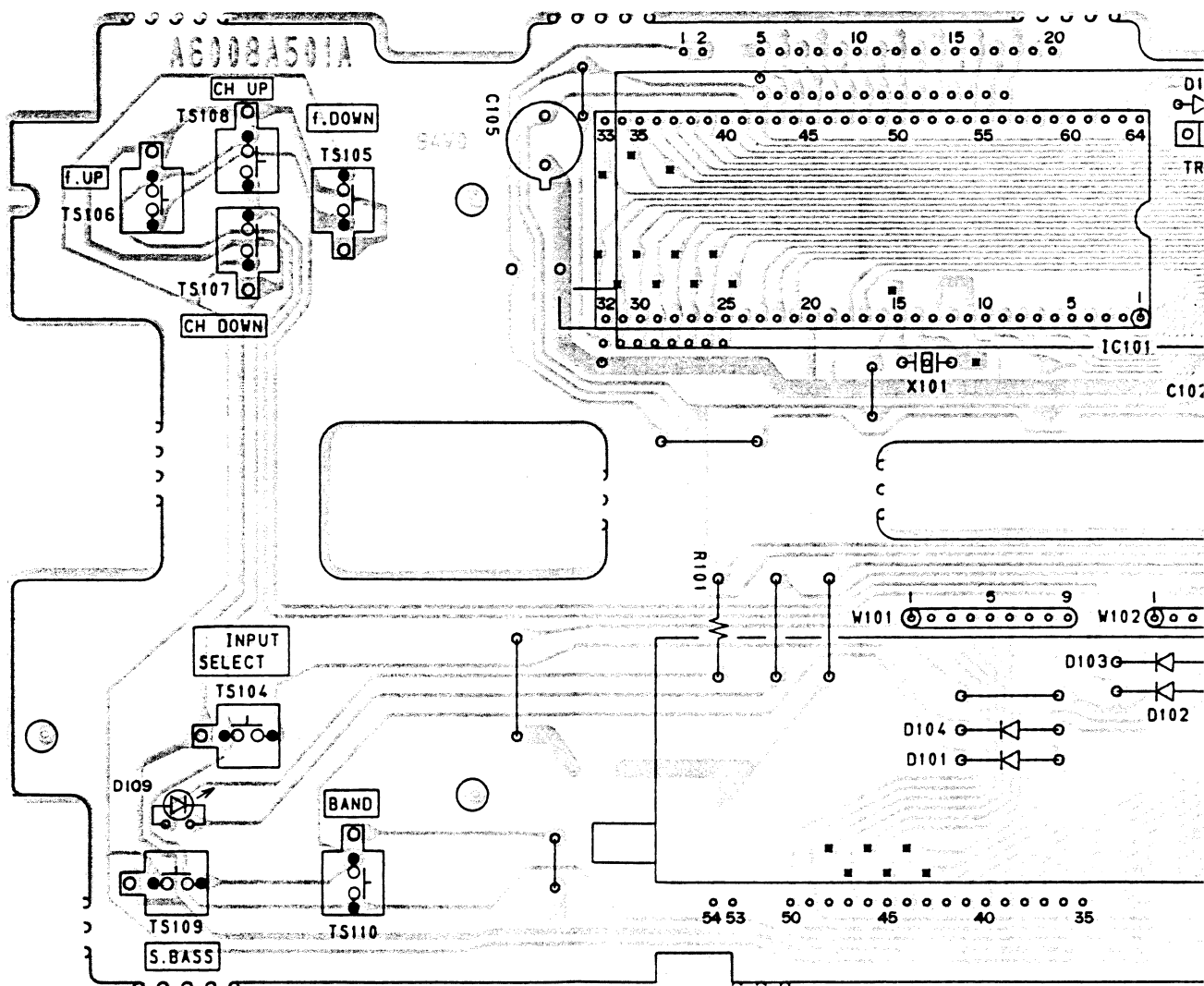
--- AUDIO SIGNAL LINE (L-CH)

NOTE  
UNLESS OTHERWISE SPEC  
ALL RESISTORS IN OHMS  
ALL CAPACITORS IN  
ALL CAPACITORS IN

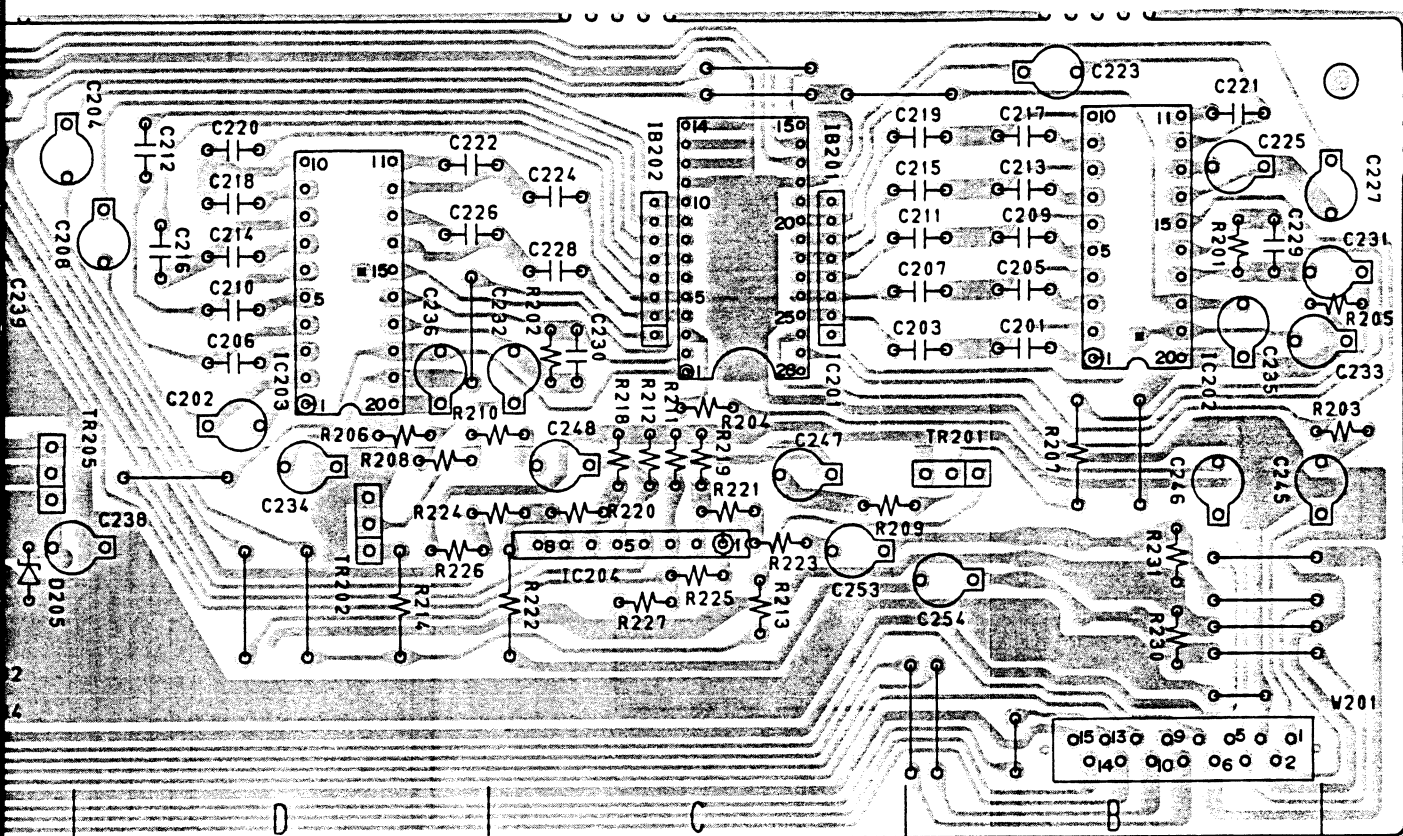




GEQ PCB A



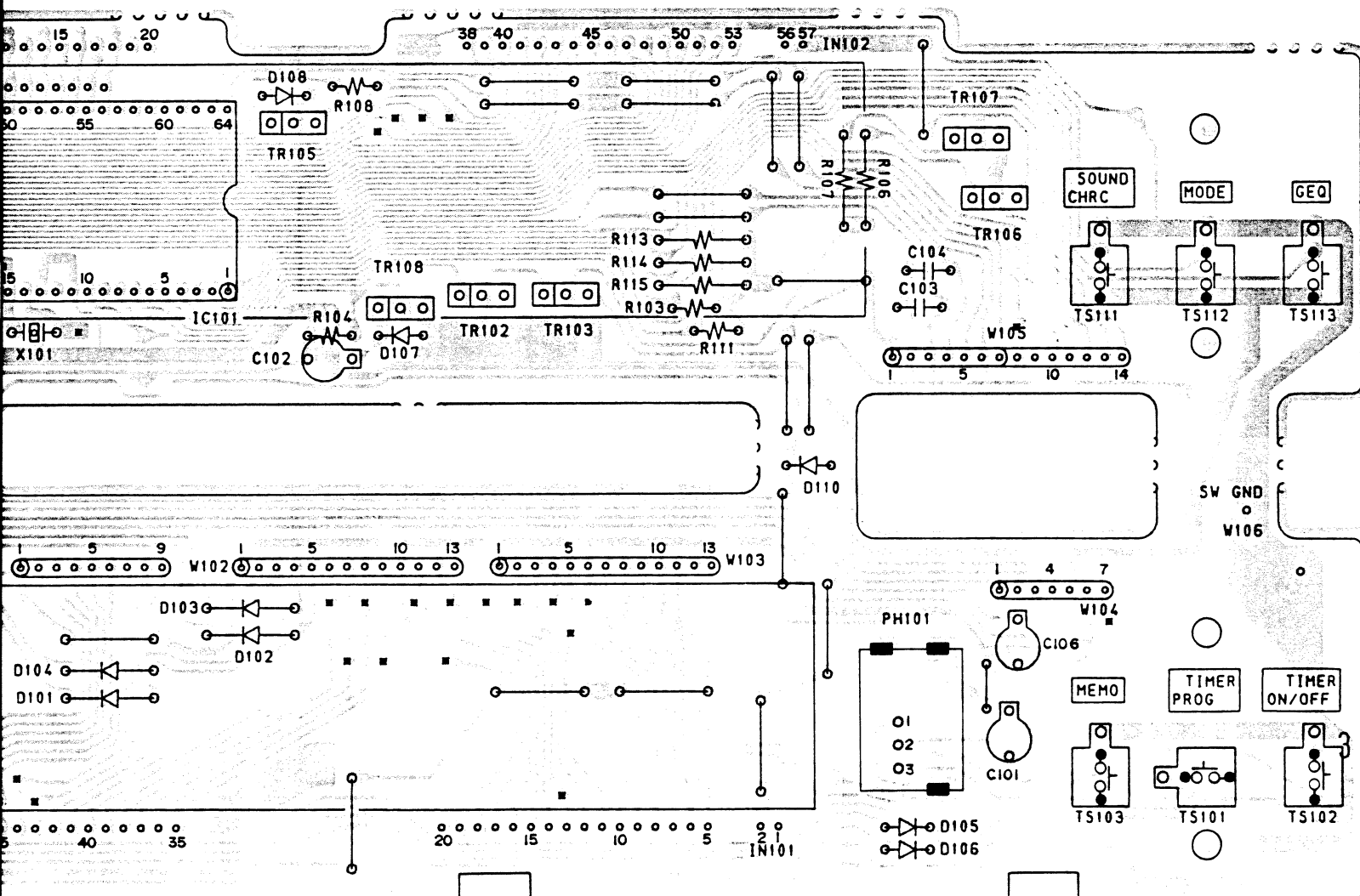
FLD PCB A60



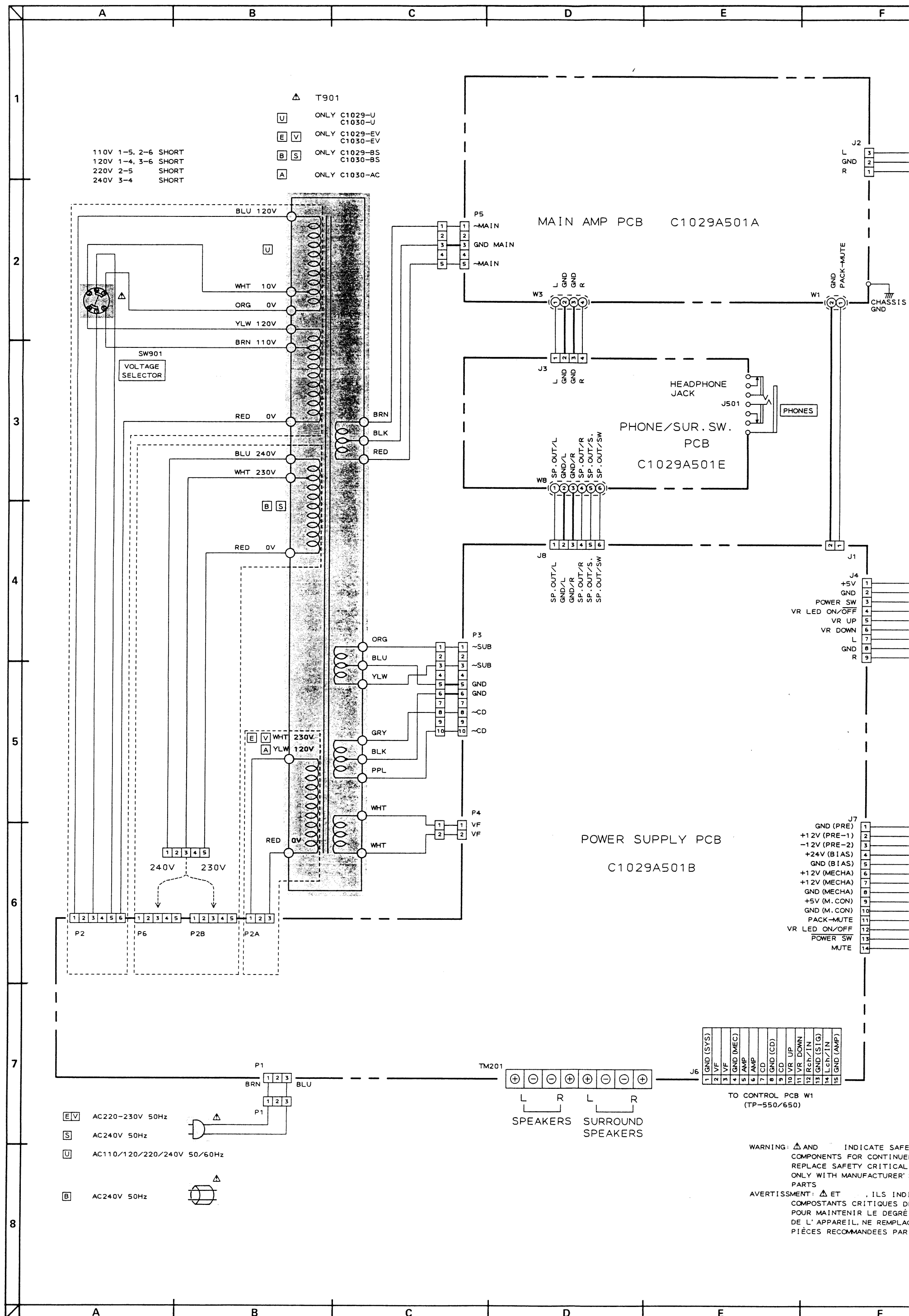
GEQ PCB A6008A501B

WARNING: ⚠ INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY.  
REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S  
RECOMMENDED PARTS

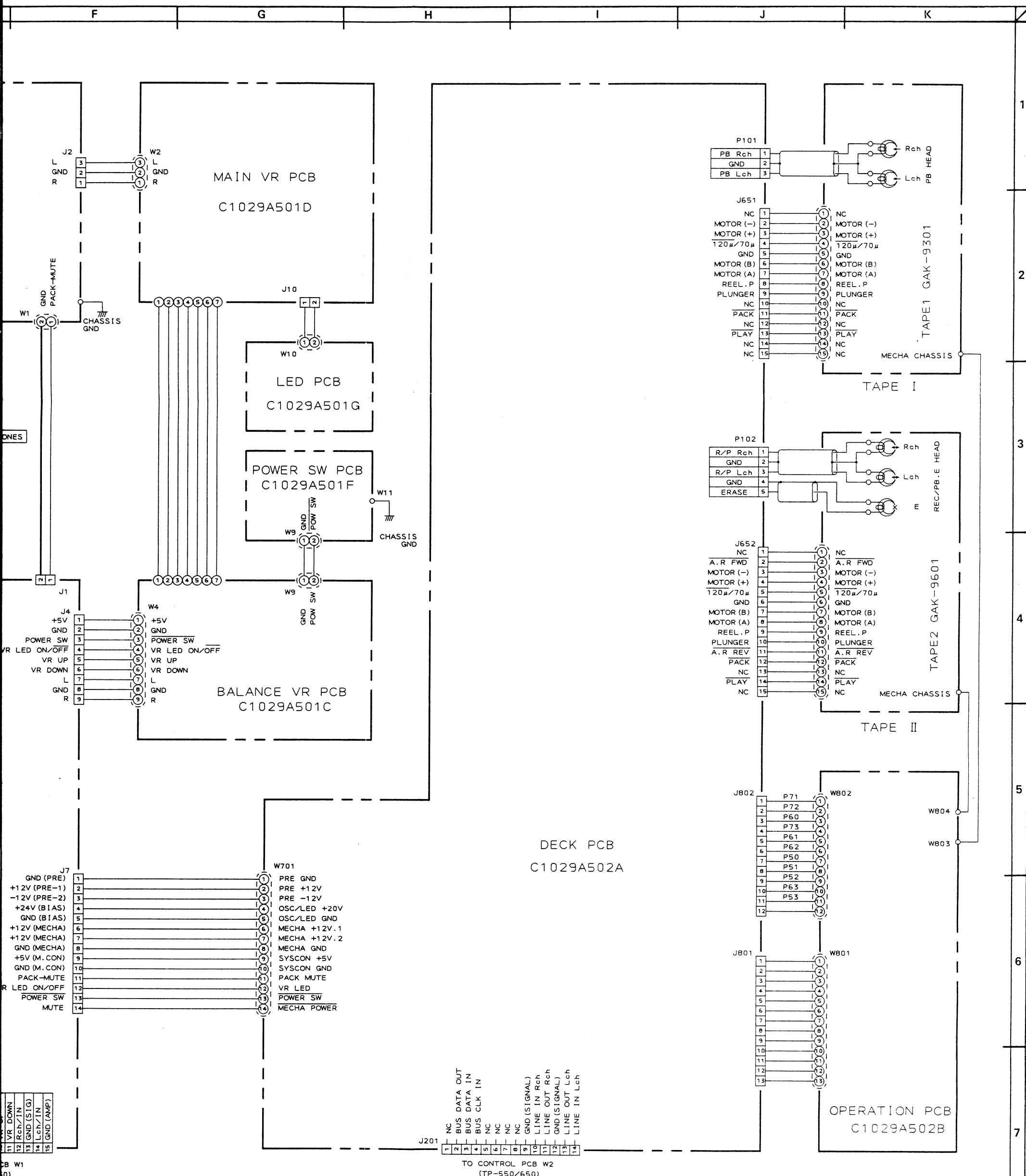
AVERTISSEMENT: ⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ.  
POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL.  
NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT



FLD PCB A6008A501A



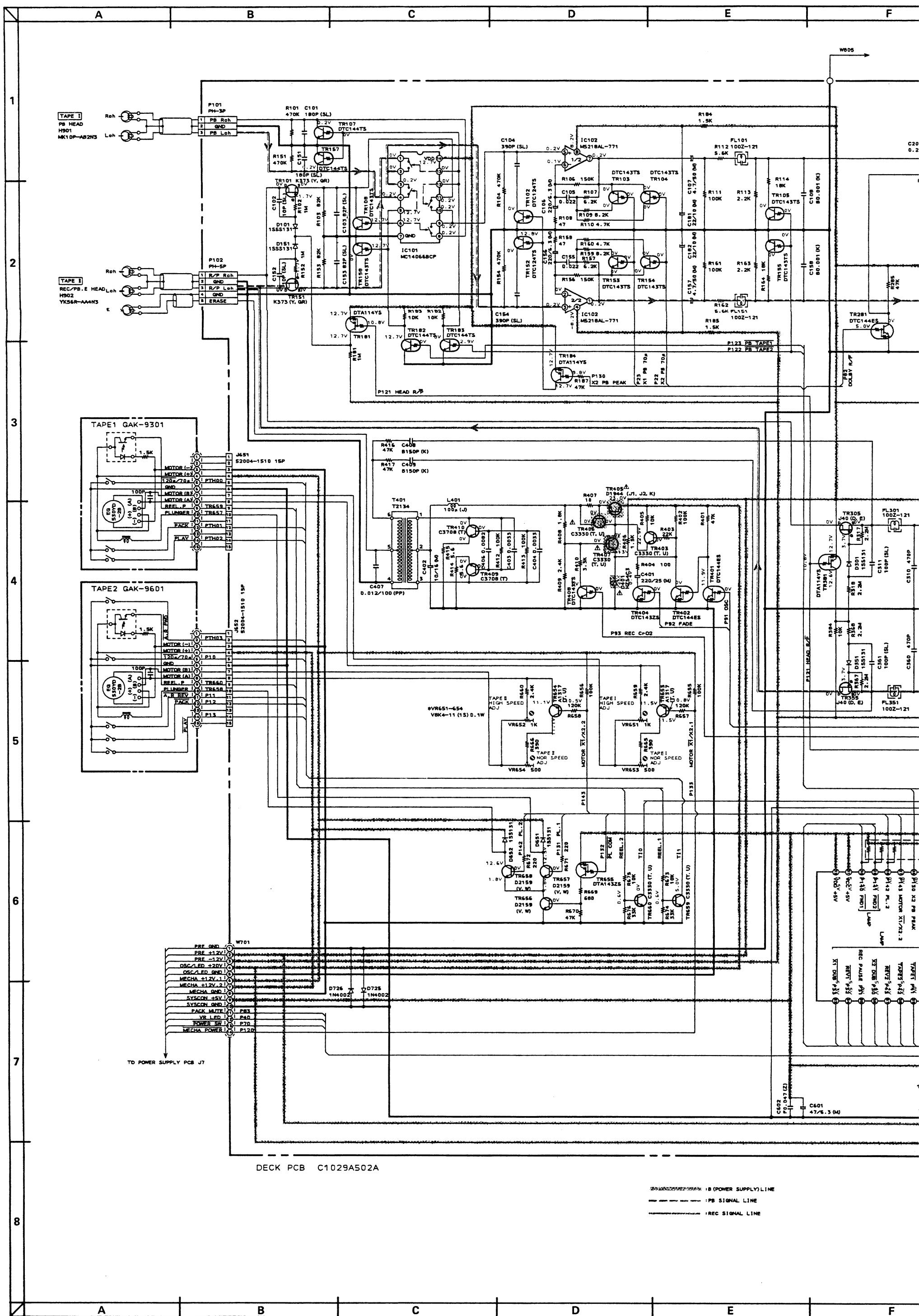




△ AND ○ INDICATE SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY. REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.

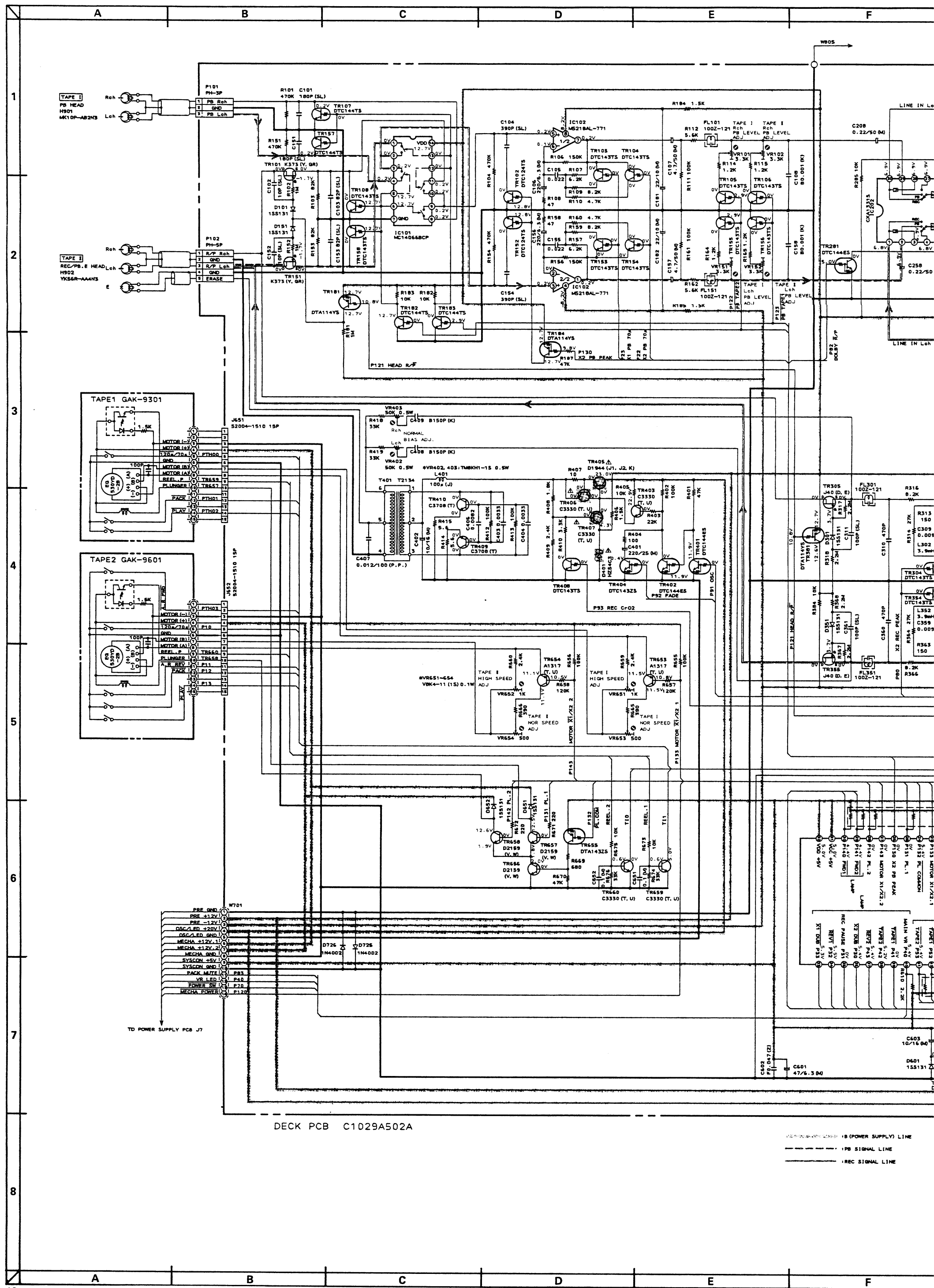
MENT: △ ET ○ ILS INDIQUENT LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT.

AX-550/650  
CONNECTION DIAGRAM  
No. 11-7 C102901M  
A1

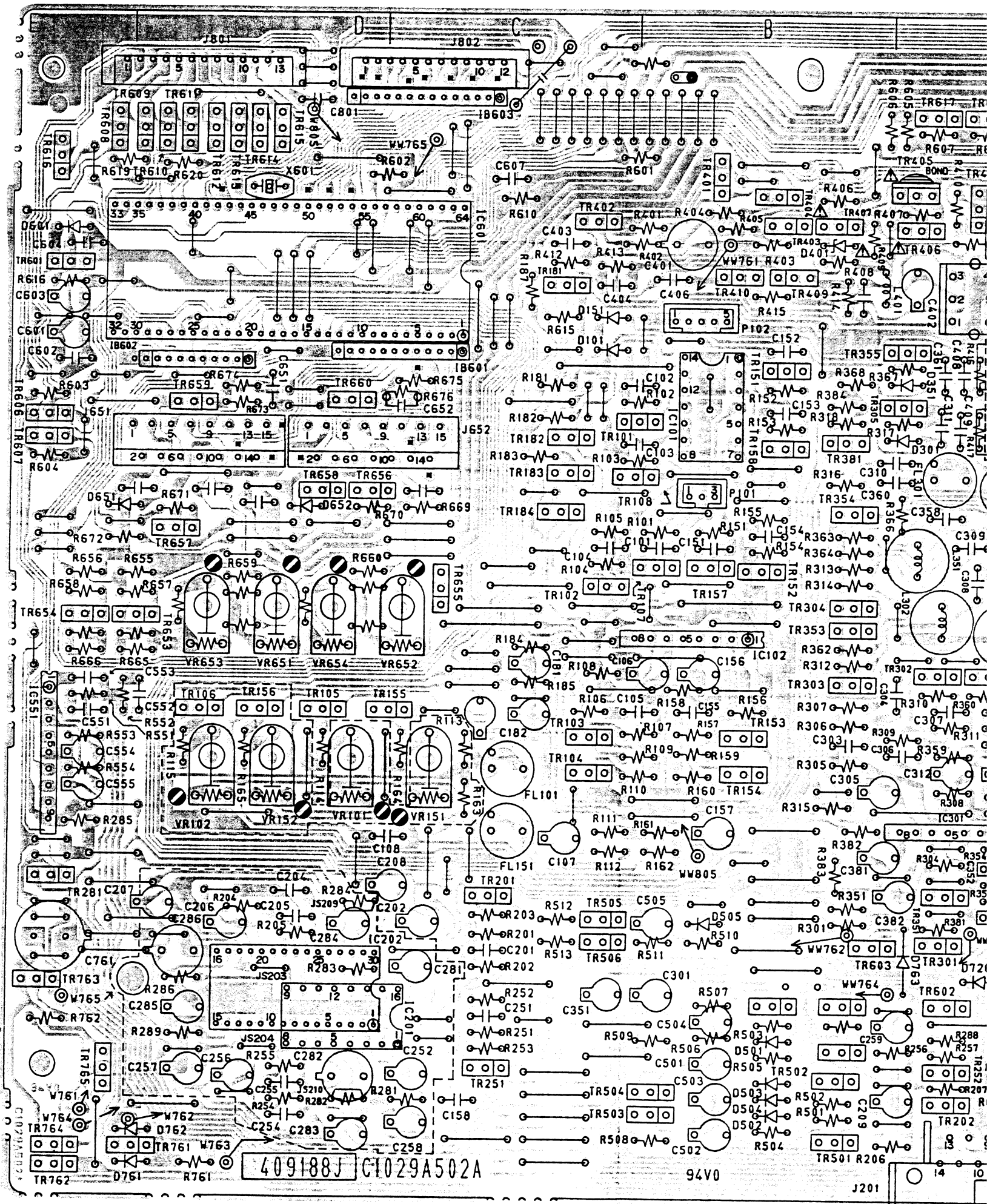












DECK PCB C1029A502A

WARNING:  $\Delta$  INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.

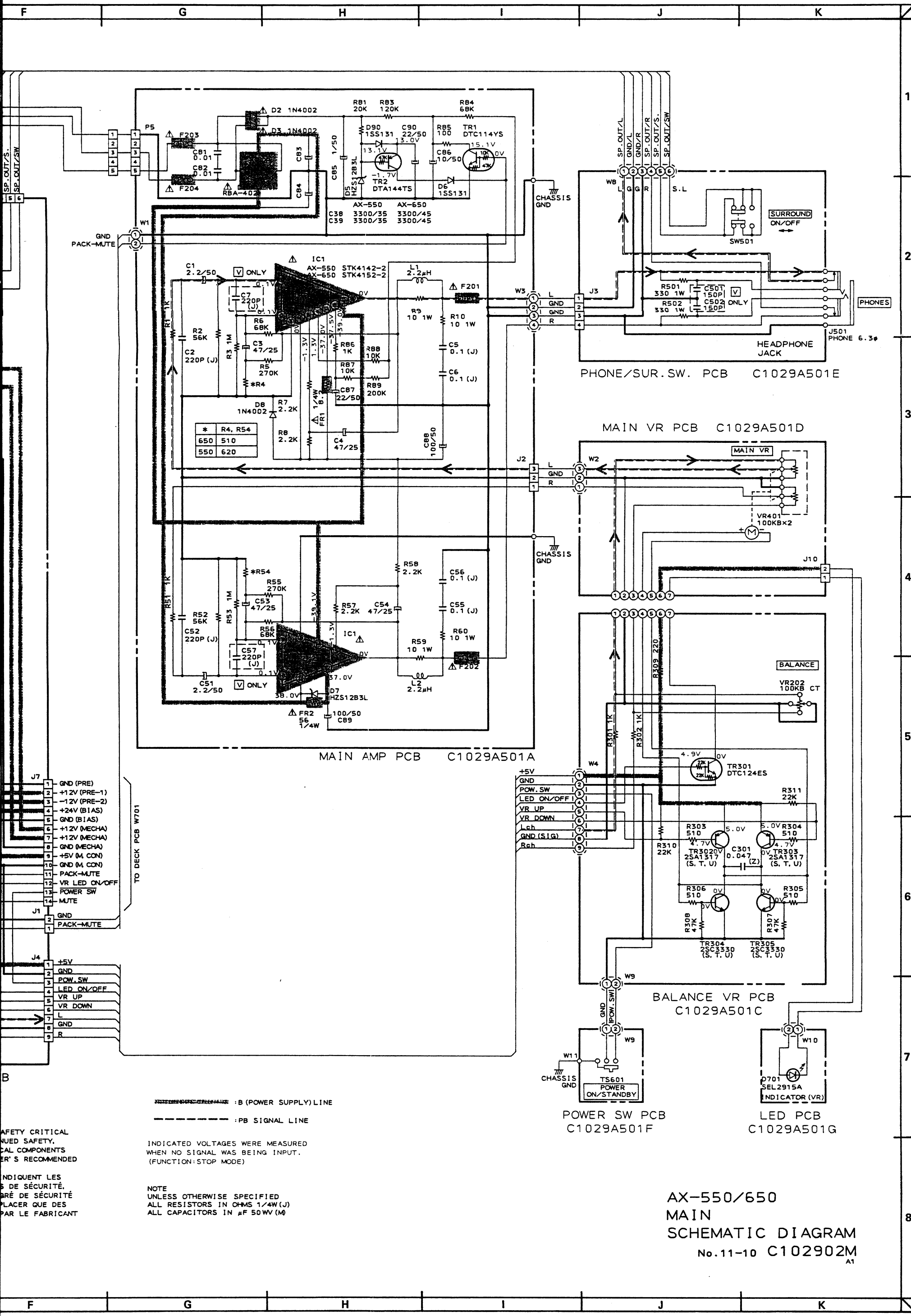
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NOTE: PARTS DIFFER DEPENDING ON REFER TO SCHEMATIC DIAGRAMS PARTS INFORMATION.

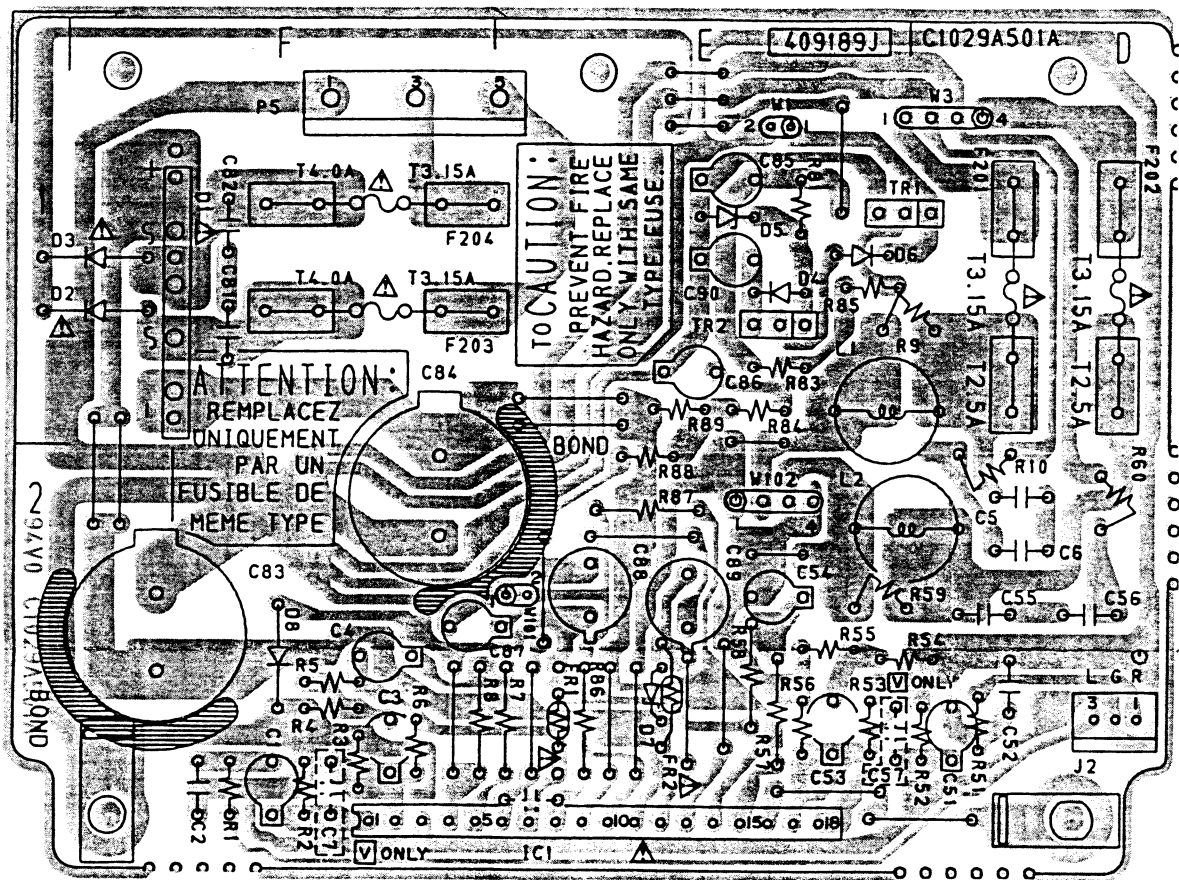




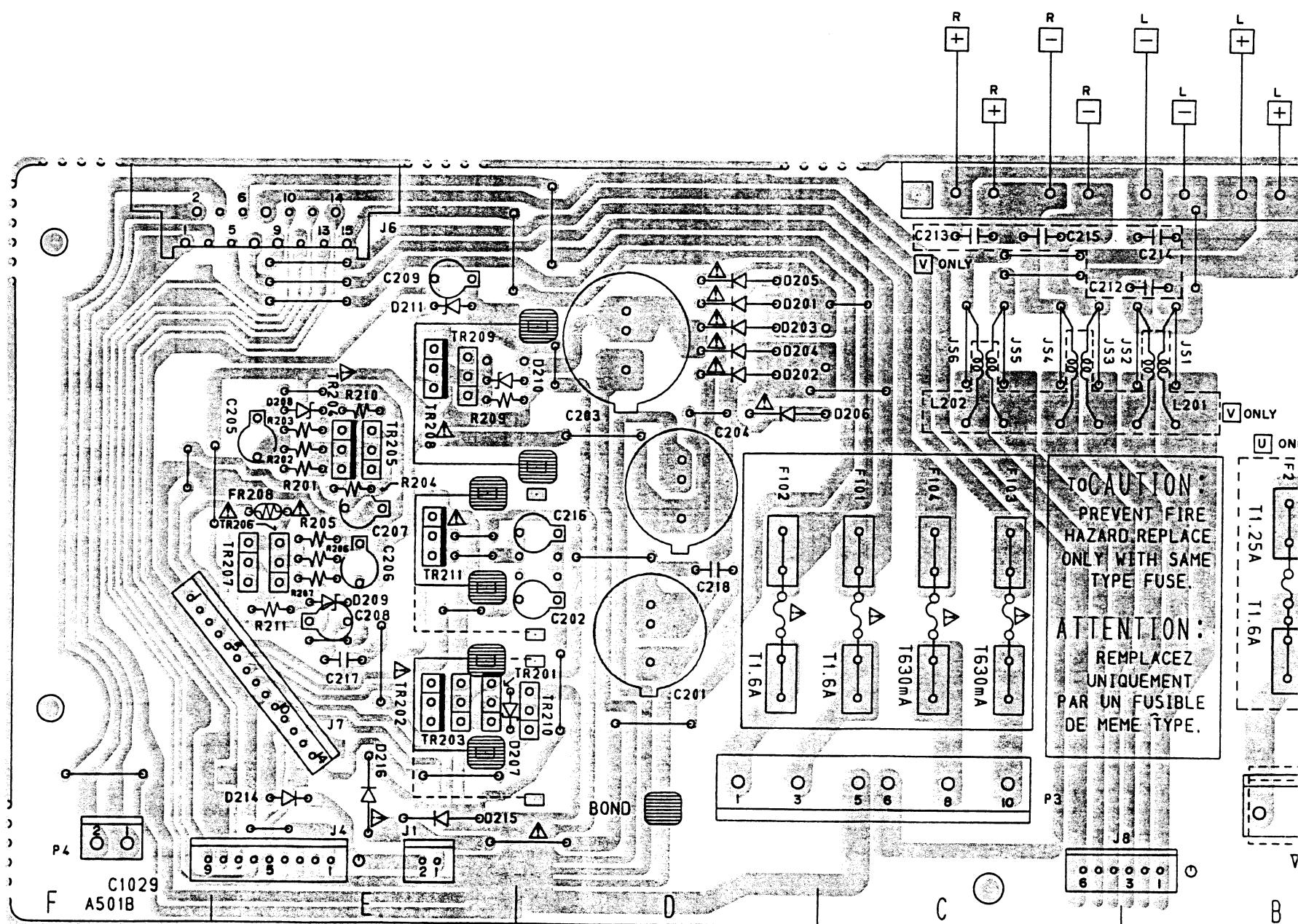








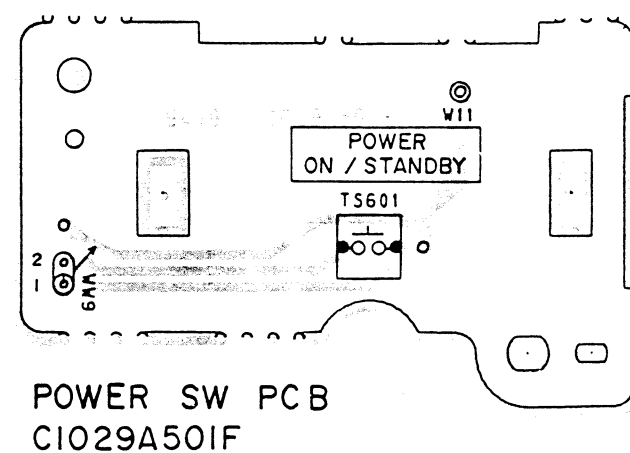
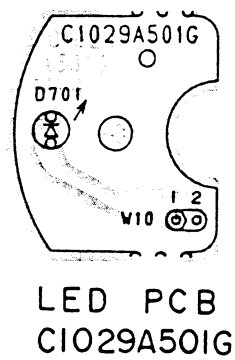
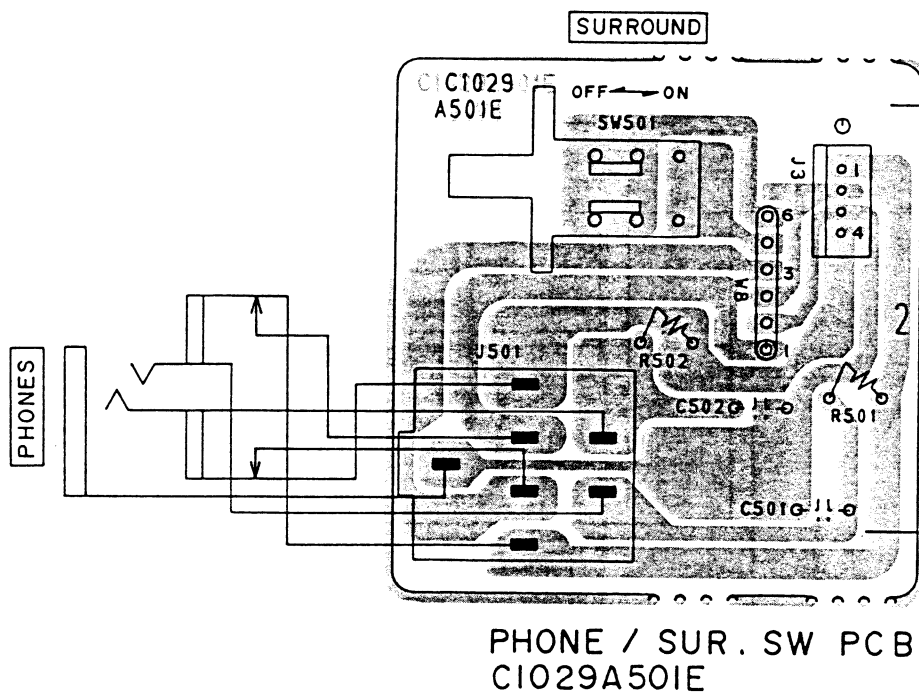
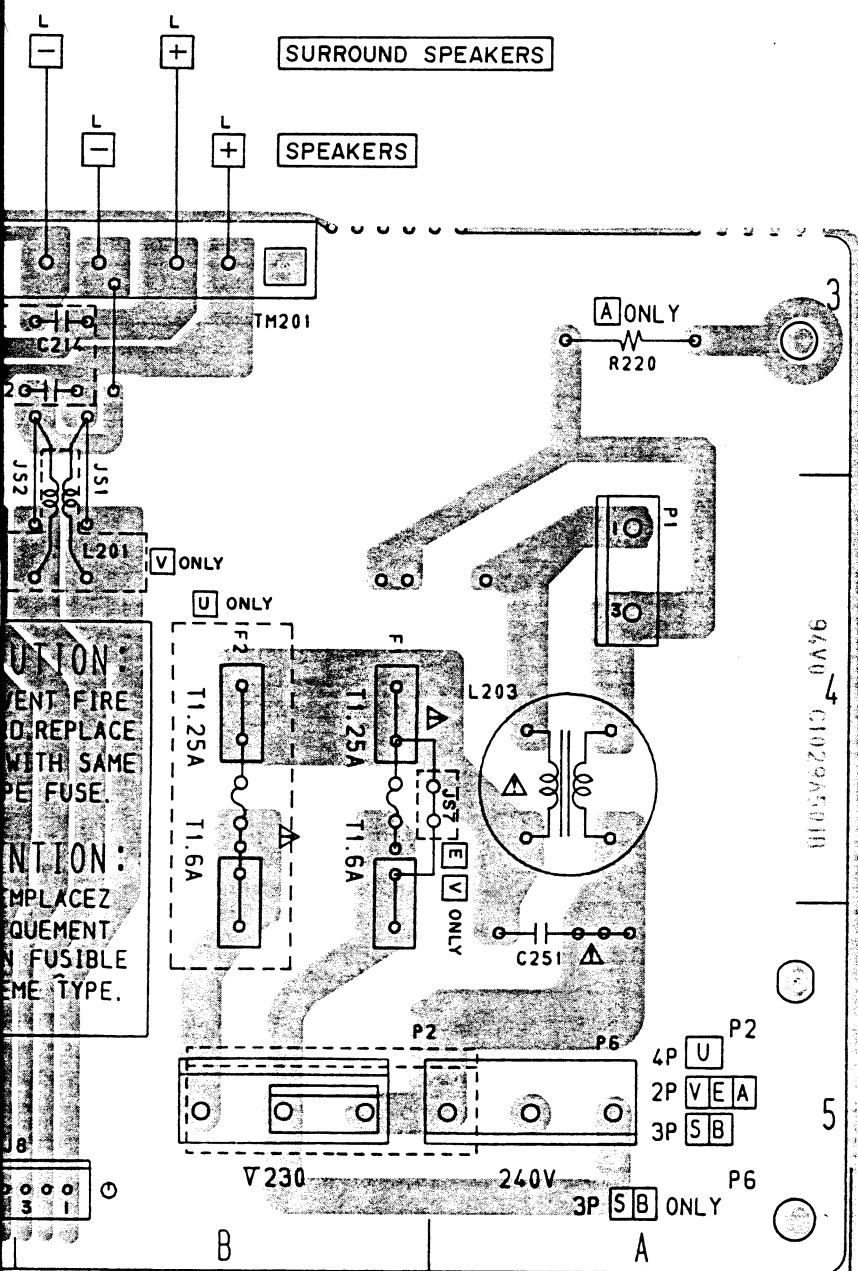
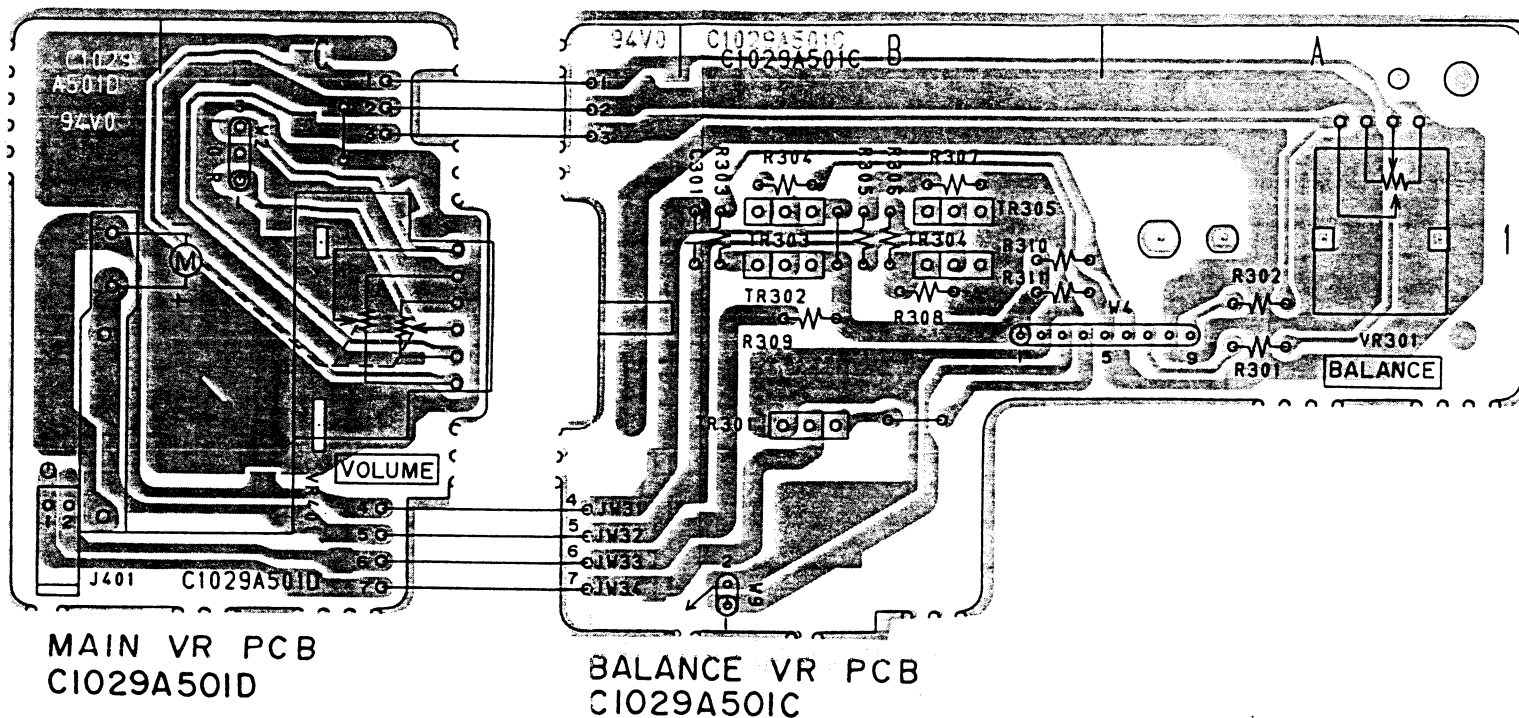
MAIN AMP PCB C1029A501A



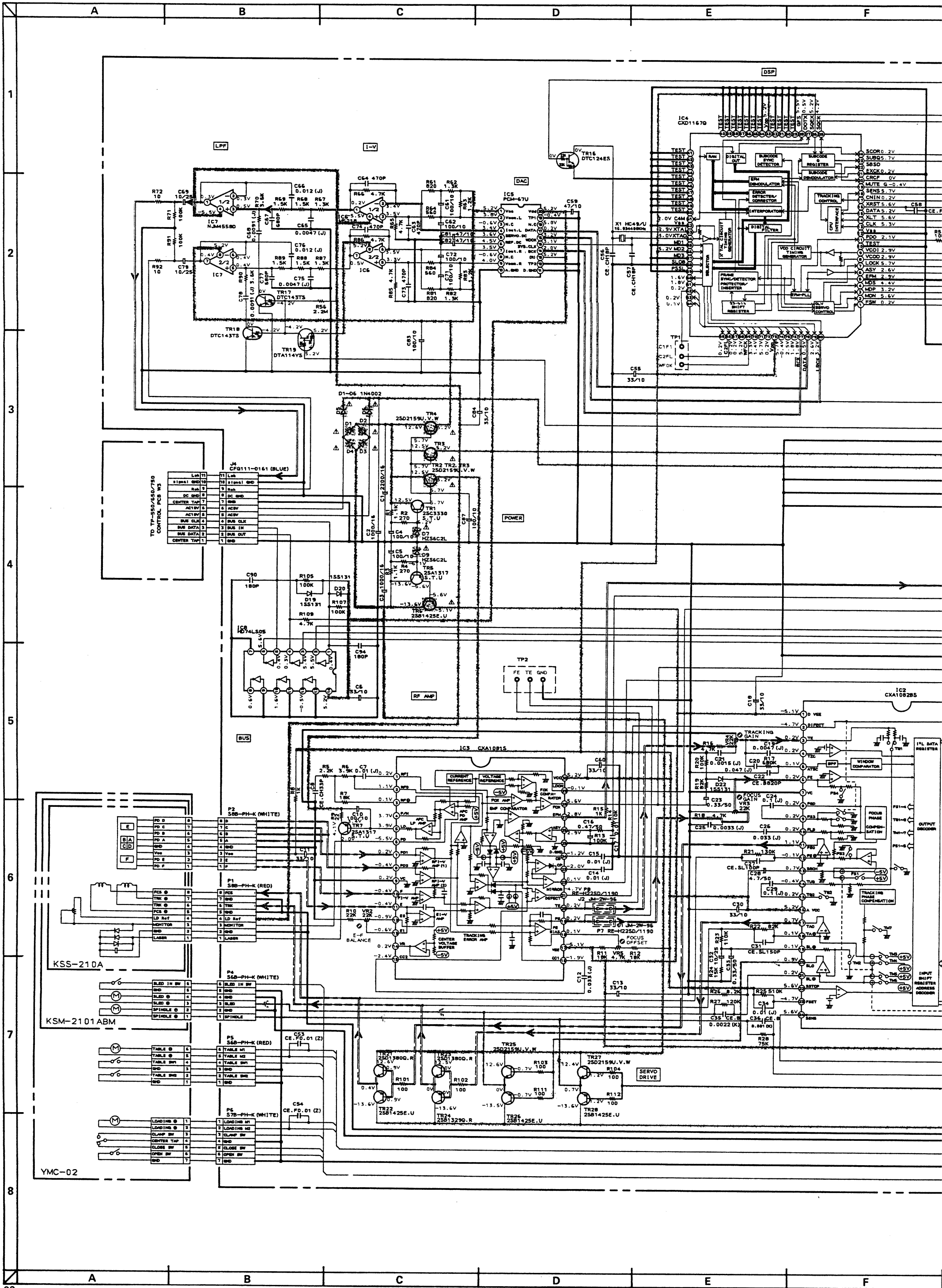
POWER SUPPLY PCB C1029A501B

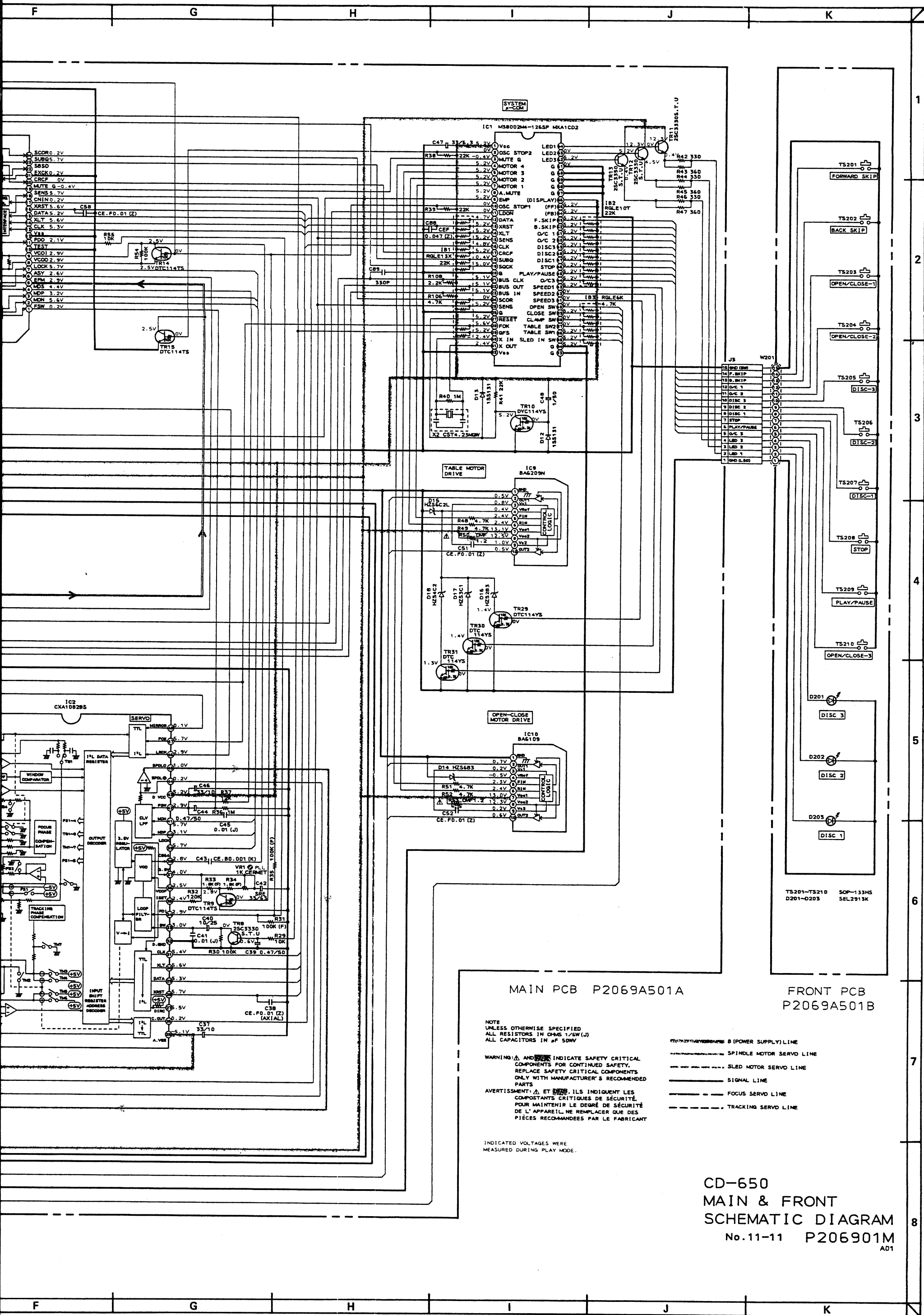
WARNING:  $\Delta$  INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY. REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

AVERTISSEMENT:  $\Delta$  IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT













LC866008A (TP-650 FLD & GEQ CONTROL MI-COM)

Pin No.	PORT NAME	I/O	DESCRIPTION
1	BUS (DO)	O	Bus data output for tuner
2	BUS (DI)	I	Bus data input from tuner
3	BUS (CLK)	I	Bus clock input from tuner
4	DATA	O	Electric VR control data output
5	CLOCK	O	Electric VR control clock output
6			Not used
7	MUTE	O	Mute control output (H:mute on)
8	FLD OFF	O	FLD / control output (H:FLD on)
9	TEST		Not used
10	RST	I	Reset input
11	XT 1		GND
12	XT 2		Not used
13	VSS		GND
14	CF 1		X'tal OSC
15	CF 2		X'tal OSC
16	VDD		+5V
17	A/D 1	I	63Hz /160Hz / 400Hz /1kHz A/D convert input
18	A/D 2	I	2.5kHz / 6.3kHz /16kHz / total A/D convert input
19	GND		GND
20	GND		GND
21	G-EQ	I	G-EQ control mode on/off input
22	MODE	I	Mode change input
23	CHARACTER UP	I	To move sound character
24	CHARACTER DOWN	I	Not used
25	DIGIT 16	O	Digit data output
26	DIGIT 15	O	
27	DIGIT 14	O	
28	DIGIT 13	O	
29	DIGIT 12	O	
30	DIGIT 11	O	
31	DIGIT 10	O	
32	DIGIT 9	O	
33	DIGIT 8	O	
34	DIGIT 7	O	
35	DIGIT 6	O	
36	DIGIT 5	O	
37	DIGIT 4	O	
38	DIGIT 3	O	
39	DIGIT 2	O	
40	DIGIT 1	O	
41	VDD		+5V power supply
42	VP		-40V
43	SEGMENT 1	O	Segment data output
44	SEGMENT 2	O	
45	SEGMENT 3	O	
46	SEGMENT 4	O	
47	SEGMENT 5	O	
48	SEGMENT 6	O	
49	SEGMENT 7	O	
50	SEGMENT 8	O	
51	SEGMENT 9	O	
52	SEGMENT 10	O	
53	SEGMENT 11	O	
54	SEGMENT 12	O	
55	SEGMENT 13	O	
56	SEGMENT 14	O	
57			Not used
58			
59			
60			
61			
62			
63	ANA. SW 1		Band frequency control output
64	ANA. SW 2		Band frequency control output

M38002M4 (CD-650 SYSTEM CONTROL MI-COM)

Pin No.	PORT NAME	I/O	DESCRIPTION
1	VCC		+5V power supply
2	OSC STOP 2	O	Oscillator control output for main CLOCK, VCO and PLL.
3	MUTE G	O	Output to stop audio data H:mute on
4	MOTOR 4	O	TRAY control output
5	MOTOR 3	O	TRAY control output
6	MOTOR 2	O	TRAY rotation control output
7	MOTOR 1	O	TRAY rotation control output
8	AUDIO MUTE	O	Not used
9	EMP	O	Emphasis control output
10	OSC STOP 1	O	Oscillator control output for main CLOCK, VCO and PLL.
11	LDON	O	Laser diode ON/OFF control output H:laser off
12	DATA	O	Command data output
13	XRST	O	Reset signal output
14	XLT	O	Latch signal output
15	SENS	I	Auto sequence end detection input
16	CLK	O	Clock signal output
17	CRCF	I	Input to detect Sub Code - Q CRC check
18	SUBQ	I	Input to detect Sub Code - Q data
19	SQCK	O	Reading clock out of Sub Code Q data
20	GND		GND
21	CD CLK IN	I	Bus clock from TUNER input
22	BUS OUT	O	Bus data output to TUNER
23	CD DATA IN	I	Bus data input from TUNER
24	SCOR	I	Sub code - Q data detect input
25	SENS	I	Auto sequence end detection input
26	GND		GND
27	RESET	I	Reset input
28	FOK	I	Focus lock detection input H:Focus lock
29	GFS	I	Input to detect PLL lock condition H:lock on
30	X IN	I	Main clock input
31	X OUT	O	Main clock output
32	VSS		GND
33	GND		GND
34	GND		GND
35	IN SW	I	Input to detect pick up position
36	LU SW 1	I	Input to detect disc rotation position
37	LU SW 2	I	Input to detect disc rotation position
38	CLAMP SW	I	Input to detect disc clamp position
39	CLOSE SW	I	Input to detect tray close position
40	OPEN SW	I	Input to detect tray open position
41	SPEED 3	O	TRAY rotation control output
42	SPEED 2	O	TRAY rotation control output
43	SPEED 1	O	TRAY rotation control output
44	OPEN/CLOSE 3	I	Input to open or close and rotate TRAY
45	PLAY/PAUSE	I	Input to change mode to PLAY from STOP and PAUSE
46	STOP	I	Input to stop every movement and return PICK UP to start position
47	DISC 1	I	Input to play DISK 1
48	DISC 2	I	Input to play DISK 2
49	DISC 3	I	Input to play DISK 3
50	OPEN/CLOSE 2	I	Input to open or close and rotate TRAY
51	OPEN/CLOSE 1	I	Input to open or close and rotate TRAY
52	BS	I	To skip to next tune
53	FS	I	To skip to next tune
54	FB	I	Input for backward quick movement
55	FF	I	Input for forward quick movement
56	DISPLAY	I	Display control input
57	GND		GND
58	GND		GND
59	GND		GND
60	GND		GND
61	GND		GND
62	LED 3	O	LED control output
63	LED 2	O	LED control output
64	LED 1	O	LED control output

**M38173M6-145FP MXA1TP3 (TP-550/650 SYSTEM CONTROL MI-COM)**

Pin No.	PORT NAME	I/O	DESCRIPTION
1	FB 2	O	For switching function output
2	FA 2	O	For switching function output
3	VR UP	O	Main VR control (UP) output H:UP
4	VR DOWN	O	Main VR control (DOWN) output H:DOWN
5	FB 3	O	SUPER BASS control output
6	DECK CLK	O	DECK bus clock output
7	DECK DATA OUT	O	DECK bus data output
8	DECK DATA IN	I	DECK bus data input
9	FA 3	O	SUPER BASS control output
10	CD CLK	O	CD bus clock output
11	CD DATA OUT	O	CD bus data output
12	CD DATA IN	I	CD bus data input
13	G-EQ CLK	O	G-EQ bus clock output
14	G-EQ DATA OUT	O	G-EQ bus data output
15	G-EQ DATA IN	I	G-EQ bus data input
16	FC 1	O	For switching function input
17	FB 1	O	For switching function input
18	FA 1	O	For switching function input
19	FLD OFF	O	FL display off output L:OFF
20	POWER LED	O	Power led control output
21	AMP MUTE	O	Pre amp mute control output H:MUTE ON
22	POWER MUTE	O	Power amp mute control output L:MUTE ON
23	POWER LED	O	Power LED control output
24	FM A/M	O	FM auto/mono control output
25	POWER DOWN	I	Back up detection input
26	REMOCON	I	REMOCON signal detection input
27	RESET	I	Reset input
28	XC IN	I	X'tal OSC
29	XC OUT	O	
30	X IN	I	
31	X OUT	O	
32	VSS		GND
33	TUNER MUTE	O	Mute control output H:MUTE ON
34	PLL STRQ	O	PLL control output
35	PLL STIN	I	PLL control input
36	PLL CE	O	PLL control output
37	PLL CLK	O	PLL control output
38	PLL DATA	O	PLL control output
39	K 1	I	Key scan input 1
40	K 0	I	Key scan input 0
41	SB	O	Super bass led control output
42	SD	O	Super direct led control output
43	DIG 9	O	Digit data output
44	DIG 8	O	
45	DIG 7	O	
46	DIG 6	O	
47	DIG 5	O	
48	DIG 4	O	
49	DIG 3	O	
50	DIG 2	O	
51	DIG 1	O	
52	DIG 0	O	
53	SEG 19	O	Segment data output
54	SEG 18	O	
55	SEG 17	O	
56	SEG 16	O	
57	SEG 15	O	
58	SEG 14	O	

Pin No.	PORT NAME	I/O	DESCRIPTION
59	SEG 13	O	Segment data output
60	SEG 12	O	
61	SEG 11	O	
62	SEG 10	O	
63	SEG 9	O	
64	SEG 8	O	
65	SEG 7	O	
66	SEG 6	O	
67	SEG 5	O	
68	SEG 4	O	
69	SEG 3	O	
70	SEG 2	O	
71	SEG 1	O	
72	SEG 0	O	
73	VCC		+5V
74	VEE		-Vp
75	AVSS		GND
76	VREF		+5V
77	TUNED	I	TUNED display input
78	STEREO	I	STEREO display input
79	CD POWER OFF	O	CD power off output H:OFF
80	FC 2	O	For switching function output

**μPD75108CW (AX-550/650 SYSTEM CONTROL MI-COM)**

Pin No.	PORT NAME	I/O	DESCRIPTION
1	PLAY-II	O	Input detect head position
2	PACK-II	O	Input detect pack
3	AR-REV-II	O	Input inhibit reverse recording
4	120μ/70μ-II	O	Input detect 120μs/70μs tape L:120μs
5	AR-FWD-II	O	Input inhibit forward recording
6	PLAY I	O	Input detect head position
7	PACK I	O	Input detect pack
8	120μ/70μ-I	O	Input detect 120μs/70μs tape L:120μs
9	REEL-II	O	Reel pulse input
10	REEL-I	O	Reel pulse input
11	x 1 PB 70μs	O	x 1/ x 2 speed playback EQ switching output
12	x 2 PB 70μs	O	x 2 speed playback EQ switching output
13	PB MUTE	O	Playback mute control output
14	CROSS	O	CROSS EDIT control output
15	DATA IN	I	Bus serial data input
16	DATA OUT	O	Bus serial data output
17	CLK IN	I	Bus clock input
18	BOP	I	Music interval detection signal input H:Music interval
19	PB TAPE I	O	TAPE I playback switching control output
20	PB TAPE II	O	TAPE II playback switching control output
21	HEAD REC/PB	O	HEAD recording/playback control output H:playback
22	MECHA POWER	O	Capstan motor stop input
23	MOTOR x 1/ x 2-I	O	Capstan motor x 1/ x 2 speed switching output L: x 1 H: x 2
24	PL COMMON	O	Plunger ON/OFF control output
25	PL-I	O	Plunger ON/OFF control output
26	x 2 PB PEAK	O	For x 1/ x 2 speed playback peaking frequency switching
27	MOTOR x 1/ x 2-II	O	Capstan motor x 1/ x 2 speed switching output L: x 1 H: x 2
28	PL-II	O	Plunger ON/OFF control output
29	FWD LAMP-II	O	TAPE II ► LAMP control output
30	FWD LAMP-I	O	TAPE I ► LAMP control output
31	VCC		+5V power supply
32	VDD		+5V power supply
33	x 1 DUBBING LAMP	O	x 1 DUBBING LAMP control output
34	REV LAMP-I	O	TAPE I ◄ LAMP control output
35	REC PAUSE LAMP	O	REC PAUSE LAMP control output
36	x 2 DUBBING LAMP	O	x 2 DUBBING LAMP control output
37	REV LAMP-II	O	TAPE II ◄ LAMP control output
38	TAPE II LAMP	O	TAPE II LAMP control output
39	TAPE I LAMP	O	TAPE I LAMP control output
40	MAIN VR LAMP	O	MAIN VR LAMP control output
41	TAPE II	I	TAPE II operation input L:ON
42	TAPE I	I	TAPE I operation input L:ON
43	x 1 DUB	I	x 1 SPEED DUBBING L:ON
44	x 2 DUB	I	x 2 SPEED DUBBING L:ON
45	RESET	I	Reset signal input
46	x 2	O	Main clock output
47	x 1	I	Main clock input
48	REW	I	Command rewind tape play L:ON
49	REV	I	Command reverse tape play L:ON
50	STOP	I	Command stop mechanism movement L:ON
51	FWD	I	Command forward tape play L:ON
52	FF	I	Command fast forward tape play L:ON
53	REC PAUSE	I	REC PAUSE command input L:ON
54	AUTO MUTE	I	AUTO MUTE command input L:ON
55	POWER SW	I	Power switch ON/OFF command input
56	PACK MUTE	O	PACK MUTE control output
57	DOLBY REC/PB	O	DOLBY recording/playback control output
58	REC MUTE	O	REC MUTE control output L:MUTE ON
59	x 2 REC PEAKING	O	For x1/ x 2 speed recording peaking frequency switching
60	REC CrO <sub>2</sub>	O	CrO <sub>2</sub> tape recording EQ switching output H:CrO <sub>2</sub> tape
61	FADE	O	FADE EDIT control output
62	OSC	O	Bias OSC control output H:OSC ON
63	x1 REC PEAKING	O	For x1/ x 2 speed recording peaking frequency switching H: x1
64	VSS		GND

